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SOVIET ECONOMY IN THE 1980's: PROBLEMS AND PROSPECTS

Part 2

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LETTERS OF TRANSMITTAL

DECEMBER 22, 1982.

To the Members of the Joint Economic Committee:

I am transmitting for the use of the Joint Economic Committee, Congress, and the interested public the second part of a compilation of papers assessing the economy of the Soviet Union. This compilation, "Soviet Economy in the 1980's: Problems and Prospects, Part 2," contains papers analyzing Soviet agriculture, demographic trends, human resources, and foreign trade.

As in the case of Part 1, the companion volume, we are grateful to John P. Hardt, of the Congressional Research Service, for helping to plan, coordinate, and edit this compilation. We also appreciate the services of Daniel L. Bond, Paul K. Cook, Douglas B. Diamond, Murray Feshbach, Richard F. Kaufman, David M. Schoonover, and Lawrence H. Theriot, who formed the Advisory Committee. Dr. Hardt was assisted by Donna Gold of the CRS staff. The project was supervised for the Joint Economic Committee by Richard F. Kaufman.

The views contained in this study are not necessarily those of the Joint Economic Committee or of its individual members.

Sincerely,

HENRY S. REUSS,
Chairman, Joint Economic Committee.

DECEMBER 18, 1982.

Hon. HENRY S. REUSS,
Chairman, Joint Economic Committee,
Congress of the United States, Washington, D.C.

DEAR MR. CHAIRMAN: Transmitted herewith is a volume of studies on the Soviet economy entitled "Soviet Economy in the 1980's: Problems and Prospects, Part 2." The studies were written by specialists who were invited to contribute and who are all experts on the economy of the Soviet Union. The authors come from universities, research organizations, and agencies of the Federal Government.

The views expressed in the papers are those of the individual authors and do not necessarily represent the views of their organizations or of the members of the Joint Economic Committee.

Sincerely,

RICHARD F. KAUFMAN,
Assistant Director, Joint Economic Committee.

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VI. AGRICULTURE AND THE GRAIN TRADE

OVERVIEW

By David M. Schoonover*

Soviet agriculture in the 1980's still is relatively inefficient and highcost, depending on huge investments of increasingly scarce resources for continued growth. Slow growth and setbacks in production in recent years, partly owing to unfavorable weather after 1978, have stymied any significant increase in per capita food availabilities. Heavily subsidized retail prices, however, accentuate the effects of rising incomes on demand. Soviet production of livestock products and supplies of food depend increasingly on imports of grain and other agricultural commodities.

Soviet agricultural policies for 1981-85 have been placed within the framework of a Food Program, announced on May 24, 1982, by Party General Secretary Brezhnev, which outlines food system goals through 1990. The Food Program retains a great deal of continuity with past agricultural policies, but is innovative in its apparent recognition that solutions to food problems in the USSR will require a better coordinated, smoothly functioning food system extending from the production and supply of inputs, through farm production and marketing, to product processing and distribution. A successfully implemented food program eventually would increase supplies of food for Soviet consumers, but the prospects for the 1980's point toward shortfalls from planned output and the continued need for large imports of grain and other agricultural commodities.

THE PROBLEMS FACING SOVIET AGRICULTURE

Key problems facing Soviet agriculture are the failure of output to keep pace with the growth in demand, the very high costs of producing livestock products (and associated subsidies), and the requirements for high allocations of investments*(5)*.[1]

Soviet agricultural output growth slowed notably in the 1970's. The gain in gross output dropped from 21 percent during 1966-70 to 13 percent during 1971-75 and 9 percent during 1976-80. Total grain output during 1966-70 jumped 29 percent compared with the preceding 5-year total, but registered gains of 8 and 13 percent during the succeeding two five-year periods. Average grain output of 205 million metric tons during 1976-80 fell substantially short of the goal of 215-220 million tons.

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*Director, Asia, Africa, and East European Division, Foreign Agricultural Service, U.S. Department of Agriculture.

[1] Numbers in parentheses refer to references at the end of the paper.

Soviet incomes maintained substantial rates of growth during the 1970's, building up pressures for expanded consumption. Average monthly wages grew 20 percent from 1970 to 1975 and an additional 16 percent by 1980. Soviet caloric intake is high, but the quality or variety of diets is poor, compared with U.S. or European standards. Per capita consumption of meat in the Soviet Union still is only about half the U.S. level and far below official dietary norms. Despite growing demand, per capita meat consumption has remained nearly constant since 1975, primarily owing to the stagnation in livestock production.

Costs of producing livestock products in the USSR are high and growing. The growth in production costs accelerated during the latter part of the 1970's, especially on collective farms. In Soviet terms, unit production costs on State and collective farms in 1980, compared with the 1966–70 averages, were twice as high on beef, mutton and wool; 70 percent more expensive on milk; and 60–75 percent higher on pork. Poultry alone has recorded more moderate cost increases.

Increased costs of livestock production are explained primarily by growing costs of inputs, including labor, and the failure to accomplish any substantial improvement in efficiency in livestock production. Worsening feed conversion ratios in much of the livestock sector are a major part of the problem of inefficient livestock production. Feed requirements for beef and milk production increased in the 1970's and, after some improvement in the first part of the 1970's, apparently turned up again for pork. Organizational and pricing problems, and unbalanced rations with inadequate protein content, are major contributors to the poor feed conversion ratios. An apparent renewed emphasis on directing investments into upgrading existing facilities, rather than into new large complexes, may enable more effective feed use of local roughage supplies*(4)*.

Soviet policy since 1965 has been to set prices paid to farms by regions at sufficiently high levels to allow a "normal profit", and to maintain stable retail prices on foods. Consistent with this policy, the high and growing costs of production generally have been matched by periodic increases in prices paid to farms, with growing subsidies on retail prices and, after the 1967 price reform, subsidies on inputs of industrial products sold to farms. Agricultural subsidies increased from 2 billion rubles in 1965 to 17 billion in 1970 and 37 billion in 1980. In the late 1970's subsidies accounted for nearly 40 percent of the total state purchase prices on agricultural products. As of 1980 two-thirds of the subsidies (and three-fourths of the subsidies on farm products) were on meat and dairy products, but practically all agricultural products received some form of subsidies.

The system of subsidies has enabled growing money incomes of the agricultural labor force and stable food prices for consumers, but has been accompanied by numerous problems. Low prices unaccompanied by adequate growth in supplies have led to longer queues, food shortages, and an increasingly active "second economy" providing opportunties for illegal private gain. Despite the subsidies on inputs, prices paid by agriculture for industrial goods increased by 35 percent from 1965 to 1975, according to one Soviet study. Moreover, the expected effect on labor productivity and efficiency has not developed. The subsidies promote wasteful use of resources and support the marginal producer. As a consequence of increasing costs and continued inefficient production, in 1980 farm purchase prices did not cover the average cost of production of meat, milk, and wool—and barely covered the cost on sugar beets. Elimination of the subsidies by passing costs on to consumers would require an increase of 40 percent or more in retail food prices. The higher farm prices promised in the Food Program will require further increases in the level of subsidies*(9)*.

In recent years, agriculture has received a remarkably high share of investments in the Soviet economy. At the same time that total investments were growing rapidly, agriculture's share grew from 20 percent during 1961–65 to 27 percent during 1976–80. Agriculture is slated to retain its high share of investments during 1981–85, but planned rates of total investment growth have been cut back sharply. The effectiveness of investments is reduced by many problems, such as low quality of machinery and poor maintenance. During 1976–80 the ratio of gross investment to net output in the USSR apparently was double that in the United States*(5)*.

SOVIET POLICIES TO BOOST FOOD AND AGRICULTURE

Soviet agricultural policies have been relatively stable since Brezhnev's program for agriculture was announced in March 1965. As with previous plans, the Eleventh Five-Year Plan (1981–85) tinkers with certain elements of the policy, but makes no abrupt departures. Changes include announced increases in prices paid to farms for several commodities and the payment of 50 percent bonuses on sales above the 1976–80 average level (instead of on the above-plan level, as in the past)*(5)*.

Renewed emphasis on private agricultural production makes the most significant shift from traditional Soviet policies. In the past, Soviet leaders periodically have made concessions to private agriculture as a temporary means to offset shortfalls on socialized farms, but there has been little tendency to actively encourage and provide incentives to private production. In a limited fashion, the new Soviet policy incorporates features of the relatively successful private farming in the Hungarian agricultural system. Private household farming in the USSR still accounts for about a fourth of total agricultural output, and 30 percent of meat production, so enhanced incentives in this sector affect a substantial share of production.

The decree of January 1981 on private agriculture provides official sanction to the contract system under which farms sell young livestock and feed to private households, who later sell mature animals back to the farms. In effect, the decree removes the limit on private livestock holdings, although scarce feed supplies likely still will restrain private production. The performance of private agriculture also will be limited by other constraints, such as lack of small mechanized equipment, poor rural transport and marketing structures, the decline in rural household population, and the declining interest in long hours of manual labor on private plots*(6)*.

The Food Program announced by Brezhnev in May 1982 provides a policy and planning framework for the Soviet food system through 1990. The thrust of the new program is to create in the USSR an integrated agro-industrial complex, to coordinate the planning, management, and operations of the agricultural production sector with the input industries serving it and the marketing, processing and distribution sector. Brezhnev spoke of establishing agro-industrial commissions, or bodies, at all administrative levels to coordinate work in the food system.

The Food Program retains apparent continuity with previous agricultural production policies, but is innovative in attempting to direct the focus of Soviet officials and managers on the linkages among various components of the system, instead of on gross output of a specific sector. Hence, the program envisages increased availabilities for consumers partly from the output of increased resource use, partly from more efficient resource use and production, and also from reduced losses in the post-harvest handling of farm products. Currently, according to the report of a Soviet commission, these losses amount to 20 percent of the production of grain, 20 percent of the fruits and vegetables, a fourth of the sugar beets, and a third of the potatoes.

The Food Program incorporates from the 1981–85 plan the new farm price procedures, placing 50-percent bonuses on above-average, rather than above-plan, sales and provides additional measures to improve the economic situation of farms. Effective January 1, 1983, purchase prices will be increased on cattle, hogs, sheep, milk, grain, sugar beets, potatoes, vegetables, and some other products. These price increases statedly will cost the State 16 billion rubles annually. The program also specifies expanded use of payments in kind to enhance incentives of rural farmers and workers *(7)*.

Food Program output goals will require substantial production gains during the 1980's. The grain target of 250–255 million tons average output during 1986–90 is only moderately higher than the 1981–85 goal of 238–243 million, probably indicating that the current goal already is considered unattainable following the poor 1981 crop. On the other hand, the meat goal of 20.0–20.5 million tons will require very strong growth from planned output of 17.0–17.5 million tons during 1981–85 and the level of about 15 million tons where production has stagnated over the past 5 years.

PROSPECTS FOR AGRICULTURAL PRODUCTION AND TRADE

The very poor agricultural results in 1981 already have made improbable the attainment of the key grain and meat targets of the 1981–85 plan. Based on recent estimates of 1981 results, grain production likely would have to average 255–260 million tons during the last four years of the period to reach the plan goal. The three consecutive poor harvests beginning in 1979 are unprecedented since World War II. Consequently, substantial improvement over recent performance seems likely during the remainder of the plan, but it is highly unlikely to be adequate to meet plan targets.

USSR climate and year-to-year weather variability clearly have a major effect in determining agricultural production results. The level of crop yields from the mid-1960's through the mid-1970's apparently benefitted from levels of precipitation higher than the long-term norms. One study has indicated that 90 percent of the increase in Soviet spring grain yields during 1962–80 resulted from this better "climate". Winter grain yields were affected more strongly by increased inputs and improved technology, but a third of the yield increase derived from improved climatic conditions. The climate-influenced results may have led planners to unrealistic expectations in the Tenth and Eleventh Five-Year Plans. A projection of average grain output for 1981–85, based on the average "climate" for 1962–80 is 212 million tons, but this apparently would require average output of 225 million tons during 1982–85. (These projections compare with a plan of 238-243 million tons.) Given past variability, projected 1981–85 production falls within a range of 200 to 225 million tons with a two out of three probability*(1)*.

Apart from weather-related problems, shortfalls in fertilizer availabilities also have caused difficulties in crop production in recent years. The five-year plan for 1980 called for deliveries of 115 million tons (gross standard units) of fertilizer to agriculture. Instead, supplies increased moderately to 82 million tons. The 115 million ton goal now has been established for 1985—five years behind the original schedule.

Although the USSR has experienced fertilizer shortages, it is one of the world's leading exporters of ammonia, the intermediate source of most nitrogen fertilizer. Ammonia, in turn, is produced from natural gas, a leading Soviet export commodity. (Production of nitrogenous fertilizer expends a relatively small share of Soviet natural gas production, but a more significant share of potential gas exports.) The trade-offs between exporting natural gas or fertilizer, or in using these resources to produce more grain depend on technological, economic and political variables. Exports of natural gas would appear to have the edge on strictly comparative advantage terms, but greater use of this resource in boosting domestic grain production may be more attractive from the standpoint of strategic and hard currency balance of trade considerations*(2)*.

There is little evidence at this time that there will be significant improvement in the basic performance of Soviet agricultural production during the 1980's. Performance ultimately depends on agricultural policies and their implementation and there have been no major policy changes that would lead to a sharp improvement. Soviet agriculture in the 1980's likely will continue to be high cost, absorbing a high percentage of national investment, and requiring increasing amounts of nonfarm inputs and a growing budgetary drain to cover subsidies. The gap between food demand and supply will remain large if the food subsidy policy is continued at current retail prices. Grain production prospects (and even planned goals) appear inadequate to reach meat output targets. Consequently, if the livestock targets are pursued, grain imports will need to remain at high levels*(5)*.

The USSR became a net grain importer in the early 1970's, and subsequently relied increasingly on the world market, and particularly the United States, for grain to expand livestock production. Beginning in October 1976, purchases from the United States were made within the framework of a long-term US-USSR Grain Agreement, although still from private commercial sources. In response to the U.S. partial embargo of 1980–81, the USSR increased purchases from other exporters and then moved to ensure these new sources of supply by signing long-term agreements with major suppliers, including Argentina, Canada, and Brazil. Grain imports during 1981/82 reached a record level of about 45 million tons. The United States supplied about a third, compared with a typical share of two-thirds prior to the embargo*(3)*.

The partial embargo has been one of the more controversial issues in recent years both in U.S. agricultural trade policy and in U.S.-Soviet relations. A meticulous assessment of the U.S. experience drew the following conclusions on the limits of an embargo as an economic sanction:

> The United States cannot viably use a grain embargo as a tool of foreign policy unless the embargo covers all products, the embargo is multilateral, the target country is particularly vulnerable, time or quantity limits are set and domestic political support is securely in place. Clearly the likelihood that such a set of circumstances would materialize in a situation short of all-out war is not great.*(8)*

The Soviet Union is expected to remain a large grain importer during the next several years. Large imports are needed to provide feed for increased livestock production—an essential commitment of Soviet plans and the new Food Program—and to rebuild stocks following several years of major harvest shortfalls. Port handling capacity is not expected to be a major constraint on trade. The Soviets have demonstrated an impressive ability to increase port handling capabilities. Hard currency difficulties are a serious problem, but are more likely to affect imports of other goods. Grain imports likely will receive priority and are expected to be determined more by crop performance than by hard currency flows*(3)*.

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PROSPECTS FOR SOVIET AGRICULTURE IN THE 1980's

By D. Gale Johnson[*][**]

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One of the reasons for the downfall of Nikita Khrushchev was the presumed failure of his agricultural policies to assure that the Soviet Union would be at least self sufficient in food, if not a major exporter. To a considerable degree Leonid Brezhnev became the General Secretary of the Communist Party due to the poor performance of agriculture in the early 1960s. Recognizing the need for significant reform of agricultural policies, the first major economic reform following the fall of Khrushchev was in the agricultural area. Since 1965 the Soviet government has expended an enormous number of rubles on agriculture through procurement price increases, food price subsidies, increased supplies of inputs such as fertilizer and capital investments in agriculture and in the industries that supply agriculture.

Unfortunately for the Soviet people it appears that the policy changes and huge expenditures have not resulted in any significant improvement in the agricultural and food situation. In fact, there is some basis for arguing that the agriculture situation confronting Yuri Andpropov is less satisfactory than the one that Brezhnev inherited from Krushchev.

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[*] Professor, Department of Economics, the University of Chicago.

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AGRICULTURAL PERFORMANCE SINCE 1950

In terms of overall output growth, USSR agriculture has performed well compared with that in Western Europe and North America since 1950. This was particularly true for 1950 through 1971 when agricultural output in the USSR increased at an annual compound rate of 3.9 percent compared to 2.0 percent for U.S. farm output. However, during the 1970s agricultural output growth in USSR has slowed and sharply so. For 1970 to 1978–80, the growth rate was 1.2 percent. Agricultural production in 1978, a record grain production year, was only 5 percent above 1973, an earlier year of record grain production. Thus from peak to peak, so to speak, production grew at no more than 1 percent annually. For the entire period since 1950, the output record remains a respectable one of 3.0 percent annual growth. However, the slowdown in output growth during the 1970's has signficant negative implications.

The success in achieving a relatively high output growth rate since 1950 tells only part of the story. Measured by other criteria, the performance of Soviet agriculture during the past three decades leaves much to be desired. Three particular difficulties will be discussed.

A first shortcoming is that while output growth has been rapid, it has not kept pace with the growth of demand. To meet the demand growth, the Soviet Union has had to depend increasingly upon imported grains and feedstuffs. With the Soviet population growing at a slow pace—less than 1.5 percent between 1950 and 1970 and 1 percent in recent years—why has the USSR found it necessary to import food and feeding materials? An important reason is that retail prices of meat and milk in state stores have remained constant since 1962 and hardly changed since the mid-1950s, while money incomes per capita have increased substantially. A political decision has been made to hold constant retail prices of meat, milk and most other foods, even though procurement prices for livestock products may have doubled since 1964. The fixed retail prices do not equate supply and demand and have been maintained only by payment of enormous subsidies on meat and milk production. In 1980, the total subsidy bill for meat, milk, potatoes and cereals, including bread, may have reached 28.5 billion rubles—an enormous sum.[1]

The subsidy levels are very substantial. It has been reported that the "state's outlay for the production, processing and sale of products in the mid-seventies double the retail price of beef, 1.4-fold higher for mutton, 1.3-fold higher for pork, 1.4-fold higher for butter and 1.3-fold higher for potatoes.[2] Since in 1979 the prices paid to farms for milk increased by 15 percent and for potatoes by 32 percent, as well as an increase for mutton, the current subsidy rates for these products are significantly higher than was true in the mid-1970s.

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[1] At a conference that I attended in Alma Ata in June 1981 it was stated by a responsible official that total retail price subsidies were 30 billion rubles in 1980, of which all but 1.5 billion rubles were for food. The food subsidies included potatoes and cereals as well as meat and milk. A somewhat lower figure of 26 billion rubles was reported in Moscow News (No. 23, 1981) but no year was given. As noted later, additional price subsidies of at least 7.5 billion rubles were added for 1981. Subsidies were further increased to more than 50 billion rubles for 1983.

[2] Izvestiya Akademii Nauk SSSR—Seriya Ekonomicheskaya, No. 1, 1980. Translation in JPRS, 75754, May 22, 1980, p. 8. In 1980 per capita consumption of meat and fat in the USSR was 55 kilograms and for meat alone consumption was about 47 kilograms. Polish meat consumption was 70 kilograms.

Per capita meat consumption, even though it has doubled since 1950, remains substantially below the level in other industrial countries with approximately the same income levels. On a comparable basis, per capita meat consumption in 1980 was significantly lower in the USSR than in Poland, by at least 30 percent. One of the nice ironies of the day has been that the USSR is subsidizing the Poles who eat considerably more meat than Soviet citizens. Or this was the case until early 1981. Because there has been and continues to be a very high income elasticity of demand for meat, per capita demand has been growing at an annual rate of about 2 percent. Not all of this demand has been met in the state stores at the official prices; a significant amount of meat is sold in the collective farm markets at prices substantially higher than the official retail prices. In recent years, the meat prices in the collective farm markets have been more than double the official prices.

A second shortcoming of Soviet agriculture continues to be the very high costs of producing livestock products. There is frequent discussion in the Soviet press that the high livestock prices do not cover the full cost of production even though the costs as calculated exclude a return for land and include only depreciation (no interest) on capital. In 1977, prior to the increase in milk prices in 1979, it was stated that milk production involved a loss on 47 percent of the farms, wool on 73 percent and potatoes on 70 percent.[3]

The third shortcoming has been the remarkably high percentage of total investment that has been allocated to agriculture during the 1970's. Agriculture's share of national investment increased from less than 20 percent during 1961–65 to about 27 percent during the Tenth Plan. Total agricultural investment during the Tenth Plan (1976–80) was approximately double that for 1966–70. It appears that during 1976–80 the gross investment to net output percentage in the Soviet Union was double that in the United States—on a reasonably comparable basis agricultural investment in the Soviet Union was 35 percent of the value of net output while it was 17 percent in the United States.

AGRICULTURE IN THE TENTH PLAN PERIOD

The Tenth Plan for Agriculture had the general appearance of a moderate and realistic plan in terms of the possibility of achieving in whole or in large part the goals that were established. In another sense, the "output objectives of the plan can be described as pessimistic." Or so I wrote in 1976. I went on to note that if the plan objectives were met, there would be little or no improvement in per capita food consumption, in terms of either quantity or composition. The only significant planned increases in food consumption per capita were for vegetables, fruits and melons. Perhaps the most striking figure in the plan was that grain consumption per capita was to remain unchanged during the plan period after significant declines in recent years.[4] At the per capita income level of the USSR, stable per capita grain consumption would not occur in an economy in which consumer preferences had a significant influence upon food consumption or one in which supply equalled demand at the prevailing prices for all food items.

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[3] U.S.D.A., ESCS, USSR Agricultural Situation: Review of 1978 and Outlook for 1979, Supplement 1 to WAS-18, p. 25. Procurement prices in 1977 for live animals (primarily beef and pork) averaged 1,570 rubles per ton (71 rubles per hundredweight); eggs, 0.83 rubles per dozen; grain, 107 rubles per ton. In 1979 milk prices were 277 rubles per ton (12.5) rubles per hundredweight). How much is a ruble worth? It depends on what the ruble is spent for. The offical rate of exchange was approximately $1.50 per ruble in 1980 but in June, 1981 the rate was $1.35. For many purposes either is an overestimate of the value of the ruble.

The meat and milk goals were extremely modest with planned increases of approximately 7 to 11 percent for the Tenth Plan compared to the Ninth. The planned increases were very small compared to the potential growth in demand; for meat per capita demand probably increased by at least 10 percent during the five years while the planned supply increase was approximately 3 percent. At the time I noted that the grain and livestock goals were quite well related to each other, gross farm output was to increase by 14 to 17 percent with grain output to increase by 18-21 percent; the 1976-80 goals are given in Table 1.

But performance fell significantly below these modest goals. The increase in grain production for the five years was 13 percent instead of 18-21 percent; the annual loss in grain output was 12.5 million tons or 62.5 million tons for the plan period. This compares to total grain imports of 102 million tons. The shortfall in meat production was even sharper. The 1980 goal was 17.3 million tons of meat and edible slaughter fats; actual 1980 output was 15.1 million tons. The 1980 output of meat and fat was only slightly larger than the 1975 output of 15.0 million tons and at 57 kilograms per capita meat consumption was the same in the two years. For the plan period annual average meat output increased 6 percent over the previous plan and thus fell below the low end of the percentage increase for the goal. Table 2 presents data on 1976-80 goals and performance and 1980 goals and performance.

TABLE 1.—OUTPUT OF SELECTED AGRICULTURAL PRODUCTS, USSR, AVERAGE, 1966-75, AND PLANS, 1971-80

Item	Quantity or value				Increase over previous 5 (percent)			
	Actual—		Plan—		Actual—		Plan—	
	1966-70	1971-75	1971-75	1976-80	1966-70	1971-75	1971-75	1976-80
Gross output (billion rubles):								
1973 prices	100.0	113.0	(1)	129-132	(1)	13	(1)	14-17
1965 prices	80.5	91.0	98.0	104-106	21	13	22	14-17
Million metric tons:								
Grain [2]	167.6	181.5	195.0	215-220	29	8	16	18-21
Cotton (unginned)	6.1	7.7	6.8	8.5	22	26	11	10
Sunflower seeds	6.4	6.0	7.0	7.6	26	−6	9	27
Sugarbeets	81.1	76.0	87.4	95-98	37	−6	8	25-29
Meat [3]	11.6	14.1	14.3	15.0-15.6	24	21	23	7-11
Milk	80.6	87.5	92.3	94-96	24	9	15	7-10
Eggs (billion units)	35.8	51.5	46.7	58-61	25	44	30	13-18

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[4] In fact, per capita grain consumption may have declined between 1975 and 1980 but only by 2 kilograms or by 1.4 percent. Between 1970 and 1975 the decline was 8 kilograms or 5 percent, a rather more reasonable rate of decline. See The USSR in Figures: 1980, p. 182 (Russian edition).

TABLE 1.—OUTPUT OF SELECTED AGRICULTURAL PRODUCTS, USSR, AVERAGE, 1966–75, AND PLANS, 1971–80—Continued

Item	Quantity or value				Increase over previous 5 (percent)			
	Actual—		Plan—		Actual—		Plan—	
	1966–70	1971–75	1971–75	1976–80	1966–70	1971–75	1971–75	1976–80
Potatoes	94.8	89.7	106.0	102	16	−5	....	14
Vegetables	19.5	22.8	24.7	28.1	15	17	([1])	23
Fruits and berries [4]	([1])	7.9	10.4	10.4	([1])	36	([1])	32

[1] Not available.

[2] Gross weight, including excess moisture and waste.

[3] Including slaughter fats.

[4] Excludes grapes.

Source: Economic Research Service, U.S. department of Agriculture, The Agricultural Situation in the Soviet Union: Review of 1975 and Outlook for 1976, For. Agric. econ. Rpt. No. 118 (April 1976), p. 29 and Central statistical board of the USSR, the USSR in Figures for 1979, Moscow, 1980, pp. 116–17.

TABLE 2.—THE 1976–80 PLAN GOALS AND PERFORMANCE AND 1980 PLAN AND PERFORMANCE, U.S.S.R. AGRICULTURE

	1976–80 (million tons [1])		1976–80 actual/plan (percent) [1]	1980 (million tons [1])		1980 actual/plan (percent)
	Plan	Actual		Plan	Actual	
Grain	215–220	205	94.3	235.0	189.2	80.5
Cotton (unginned)	8.5	8.9	105.7	9.0	10.0	111.1
Sunflower seeds	7.6	5.3	69.7	7.7	4.65	60.4
Sugar beets	95–98	88.4	91.6	....	79.6	....
Meat	15.0–15.6	14.9	97.4	17.3	15.1	87.3
Milk	94–96	92.7	97.6	102	90.7	88.9
Eggs (billion units)	58–61	63.0	105.9	66.8	67.7	101.3
Potatoes	102	82.4	80.8	104	66.9	64.3
Vegetables	28.1	26.0	92.5	30	25.9	86.3
Fruits and berries	10.4	9.4	90.4	....	....	....
Wool	0.473	0.459	97.5	0.515	0.462	89.7

[1] All reference to million tons is in metric tons.

[2] Based on mid-point of 1976–80 plan goals. Actual/plan means actual output divided by plan output multiplied by 100 to convert to percent.

Sources: The USSR in Figures for 1980 (Russian edition), and USDA, ESS, Agricultural Situation: USSR: Review of 1980 and Outlook for 1981, Supplement 1 to WAS–24.

Milk production fell short of both the Tenth Plan and 1980 goals, though the major problem with milk in the Soviet Union is not the output level but the inadequate utilization of the available supplies. Egg output met both the Tenth Plan and 1980 goals.

Cotton was the only crop for which the Tenth Plan and 1980 goals were met. For the other six crops, besides grain, for which we have data for both production and 1976–80 goals, production fell significantly short of the goals. Sugar beet production, which was to increase 25–29 percent, fell some 8 percent below the Tenth Plan goal. No 1980 goal was given for sugar beets. Vegetable production was to increase 23 percent for the plan; production fell short of the plan goal of 28.1 million tons by 7 percent for the period and 1980 production was 14 percent short of the 1980 goal. Production of fruits and berries during the Tenth Plan fell short of the goal by 9 percent.

Sunflower seed production was to have increased by 27 percent for the plan; instead of increasing production averaged 11 percent below 1971–75. Potato production was to increase 14 percent during the plan period; instead average output was 8 percent below the previous plan period.The 1980 potato output was the smallest in almost three decades and was only three fifths of the 1980 goal.

The Tenth Plan period can only be described as a disastrous one in terms of agricultural performance. Even though there was enormous capital investment, and increases in machinery deliveries and fertilizer supplied to agriculture, grain imports increased significantly.[5] During the Ninth Plan, net grain imports totaled 55 million tons; during the Tenth Plan 102 million tons.

In my opinion one of the most disquieting aspects of the Tenth Plan was that grain fed to livestock increased from an estimated annual rate during the Ninth Plan of 94 million tons to 121 million tons or 28 percent. Over the same span of time meat and milk production each increased by only a little more than 6 percent. Only egg output increased even approximately in proportion to the increase in grain used as feed and at a 23 percent increase did not quite equal the 28 percent increase in grain used as feed. With meat and milk production in 1980 little above the level five years earlier, the large increase in grain used as feed raises questions about the potentials for further increases in livestock and milk production based on increased amounts of grain.

PROSPECTS FOR THE 1980'S

Before turning to the goals of the Eleventh Plan, I shall make some general comments about factors that are likely to affect the performance of USSR agriculture during the 1980s. It is common to attribute a significant part of the difficulties that USSR agriculture has in expanding output to its climate and to blame the large year to year output variability upon weather fluctuations. There is validity to the description of the Soviet agricultural areas that says that where there is adequate moisture it is too cool and where there is enough warmth it is too dry. But I believe that climatic factors are given too much weight in attempts to explain the slow growth and variability of USSR farm output. Agricultural policy influences production variability. The USSR could have reduced variability of grain production in its dry areas if it used fallow more extensively than it has in the past or currently. Canada, which produces almost all of its wheat under climatic conditions as subject to drought or cold as does the Soviet Union, has achieved much greater output stability through the large scale use of summer fallow. It is probable that extending the use of summer fallow for grain would reduce total grain production somewhat, but it would permit significantly greater stability. And given the very high seeding rates used in the Soviet Union—240 kilograms per hectare compared to less than 85 in the United States—the saving of seed by increasing fallowing would offset a significant part of the output loss.

It appears unlikely that there will be a reversal of several of the factors that have affected the cost structure of agriculture during the past two decades. These cost factors have necessitated the significant increases in prices paid to the farms; these price increases when associated with fixed retail prices have resulted in the enormous subsidy burden that now exists and which increases each year. In an economy that claims to have controlled inflation, production costs for major farm products increased significantly during the 1970s. Between 1970 and 1979 the cost of producing milk increased by 51 percent, cotton by 17 percent, sunflowers by 42 percent, sugar beets by 43 percent and eggs by 17 percent. While farm wages and earnings were increased significantly during the decade, labor costs per unit of output either remained stable or declined. The increases in costs were apparently due to the costly means adopted for replacing labor and/or sharp increases in the prices of farm inputs and machinery.

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[5] The Tenth Plan had an ambitious goal for the delivery of fertilizer to agriculture, with a planned increase of 52 percent. Actual deliveries fell short of this, increasing by 31 percent. Fertilizer deliveries during the Tenth Plan averaged 18.1 million tons in terms of nutrient weight and 13.8 million tons during the Ninth Plan.

There have been substantial increases in the prices of many farm inputs. In a period specified as "in recent years" the price paid per horsepower for tractors and attachments has increased by 70 percent; the prices of mineral fertilizers by 20 percent; mixed feeds by 100 percent, and the costs of cattle and hog barns by 130 to 300 percent.

Another factor in increasing costs has been the deterioration in performance of major farm machines. Between 1970 and 1976 the daily output of work per tractor declined from 7.2 to 7.0 hectares; for combines even more drastically from 7.3 to 6.4 hectares, a decline of 12 percent. The percentage decline in the amount of grain per combine day was at least equal to the percentage increase in the number of combines between 1970 and 1976. Consequently, there was no reduction in the amount of time required to complete the harvesting of grain, and the losses from a too-extended period of harvesting were at least as great at the end of the period as at the beginning. There is general agreement among those acquainted with Soviet agriculture that the length of time required to complete the grain harvest results in substantial output losses in most years.

A further factor causing high costs in agriculture is the inability of the system to retain the skilled workers required to operate the rather complex machinery that is now in use. Between 1971 and 1974, 2.6 million tractor drivers and machine and combine operators were trained but during those years the total supply of such workers in agriculture increased by only 269,000. In 1979, 1.14 million tractor, combine and auto driver/mechanics were trained for agricultural work, but the number employed on farms increased by only 32,000. Obviously a very large fraction of those trained decided to use their newly acquired skills in other and more rewarding activities and these activities were in the nonagricultural sector. This loss of trained manpower is due, not to the weather, but to policy choices that have been made. And, if anything, conditions deteriorated during the 1970s.

Poor quality of farm machines and/or poor maintenance results in a high rate of scrappage of farm machinery, rates much higher than in the United States for example. Grain combines had an annual scrappage rate of 12 percent in the USSR for 1971–75 and 15 percent for 1976–80 compared to 8 percent in the United States. For tractors the rate was 12–13 percent in the Soviet Union and about 4 percent in the United States. The scrappage rate for windrowers for 1971-75 in the USSR was an astronomically high figure of almost 18 percent—an average life of only a little more than five years. The windrower is a relatively simple machine that cuts the grain and puts the grain in rows—a slightly complicated hay mower. The grain, with the straw, dries for a few days and is then combined from the windrow. The high rate of scrappage results in a slowly growing inventory of farm machines. The scrappage rate for farm trucks for 1976-80 was even higher at 17 percent.[6]

It is generally agreed that the usable inventory of farm machines in the USSR is too small for adequate and timely performance of numerous farm operations, including both seeding or planting and harvesting of many crops. One of the important contributions of mechanization to agriculture in North America has been to permit more timely operations and higher output as a result.

I believe there exists a substantial potential for increasing farm production in the nonchernozem or nonblack soil zone of the USSR. This is a very large geographical area of 112 million hectares of farm land—this is as much farm land as in twelve Minnesotas. It is an area with adequate rainfall and temperatures suitable for small grains, potatoes, hay, and green fodder. The soil is low in quality, requires drainage and liming as well as large annual inputs of fertilizer. It also requires a high level of management and care and this may well be the reason why efforts to increase production in the area have met with such little success.

Hay yields in the USSR, including those in the nonchernozem region, are abysmally low. For all of the country yields are less than two tons per hectare; in states with climatic and soil conditions similar to the major hay-growing regions of the USSR, yields average four to five tons per hectare and this is for tame hay excluding alfalfa. If alfalfa is included the yields for Michigan, Minnesota and Wisconsin are about six tons per hectare. Yields of tame hay in the Prairie Provinces average four tons per hectare. Because tame hay is harvested from 40 million hectares in the USSR, a doubling of yields would have a major impact upon feed supplies. It would be equivalent to 30 million tons of grain or the output from more than 20 millon hectares of grain. Wild hay is harvested from an even greater area than tame hay and offers a significant potential, either through improvement of the wild hay yields or a transfer to tame hay by drainage and liming for increased feed production.

I reemphasize the point I made earlier—both the level and variability of agricultural production in the USSR are influenced a great deal by policy decisions as well as by climate. The quality of farm machinery, the timeliness of delivery of fertilizer to farms, the limited use of summer fallow, the neglect of hay as feed crop, and the failure to hold large stocks of grain are not due to climatic factors but are policy matters. There is much that can be done to offset climatic variability, either in terms of its effect upon average output or in fluctuations in that output. For whatever the reasons may be, the USSR has chosen to undertake or encourage few internal measures designed to stabilize production. Instead there appears to have been a reliance upon the international grain and feed markets as the mechanism for evening out feed production variations and for meeting the growing demand for livestock products. In the process the large and largely uncontrolled variability of Soviet agricultural production has had to be absorbed by the rest of the world.

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[6] USSR in Figures, 1979, pp. 130-33 (English edition) and 1980, pp. 122-24 (Russian edition).

THE ELEVENTH PLAN FOR AGRICULTURE

Even though we are now in the second year of the Eleventh Plan and many of the decisions affecting agricultural production and incomes have already been made, less information has been made available concerning the Eleventh Plan for agriculture than has been true for the previous two plans. Surprisingly the goals included in the plan directives published in December 1980 were little changed from the general indications of plans announced in 1978. The December 1980 directives seem to have taken no notice of the present low level of meat output and the difficulties there will be in increasing meat output significantly during the first two years of the plan. However, at the 1981 Party Congress it was indicated that the 1985 goal for meat production was 18.2 million tons instead of the earlier figure of 19.5 million tons but the goal for the plan period was not changed.

Table 3 gives the information that has been provided for the output goals of the Eleventh Plan and provides comparisons with the actual and planned outputs for the Tenth Plan. Annual average production is planned to increase by 12 to 14 percent or by 2.3 to 2.7 percent annually. Grain production is planned to increase by 17 percent compared to a 13 percent increase achieved in the Tenth Plan. The cotton production goal is for an increase of a modest 3 percent and the potato goal is for an 8 percent increase over actual output. But the Eleventh Plan goal is 13 percent below the Tenth Plan goal for potatoes. Sugar beet production is planned to increase by 15 percent.

Meat production is planned for a 16 percent increase, after an increase of only 6 percent during the Tenth Plan. Milk output is planned for a small increase of 5 percent while planned egg output would represent an increase of 14 percent.

TABLE 3.—11TH PLAN AGRICULTURAL GOALS WITH COMPARISONS TO THE 10TH PLAN

Gross agricultural output	1981–85 plan (million tons [1])	1981–85 plan/ 1976–80 plan (percent)	1981–85 plan/ 1976–80 actual (percent)
Grain	239	110	112–114
Cotton (unginned)	9.2	108	103
Sunflower seeds	6.7	88	126
Sugar beets	100	104	113
Meat (slaughter weight)	17.25	113	116
Milk	98	103	105
Wool	0.47	103	102
Eggs (billion units)	72	121	114
Potatoes	89	87	108
Vegetables	29.4	105	113
Fruits and berries	11.5	111	122
Grapes	7.6	....	136

[1] All reference to million tons is in metric tons.

Sources: Current Digest of the Soviet Press, XXXII, No. 48 (Dec. 31, 1980): 13–15 and XXXIII, No. 4 (Feb. 25, 1981): 14; U.S. Department of Agriculture, Agriculture Situation: Review of 1979 and Outlook for 1980, USSR, Supplement 1 to WAS–21, April 1980, and Ekonomika sel'skoga khozyaystva, No. 12, 1981, pp. 1–10.

There appears to be an imbalance between the planned increase in grain production and the meat output goal. Unless other feed components are to increase significantly, the increase in grain availability would not be large enough to permit the planned increase in livestock output. There appears to be no possibility, if the livestock output goals are to be met, for a reduction in the recent high levels of grain imports.

INVESTMENT AND INPUT SUPPLY

Information has been provided on planned deliveries of trucks, tractors, and fertilizer as well as a projection of investment in agriculture for 1981–85. There can be no question that the growth rate of investment has slowed down and will grow slowly during the present plan period. Starting with the Eighth Plan (1966–70) annual growth rates of investment have been 9.1, 9.7 and 2.5 percent with a planned rate for Eleventh Plan of 3.3. True, given the current high levels of annual investment any increase in investment will yield a very large total. The Tenth Plan investment total for agriculture of 172 billion rubles was almost met—the shortfall was only 0.6 percent. The 1981–85 plan, if fulfilled, would push the five-year investment level to the enormous total of 195 billion rubles, or an annual average of 39 billion. If this level of investment were efficiently used, it is more than adequate for achieving a significant rate of output growth. Agricultural investment is planned to account 27 percent of total national investment.[7]

The tractor delivery goal during the Tenth Plan was not quite met, tractor deliveries falling 5 percent short; truck and combine deliveries were at plan levels. Actual deliveries were greater than those of the Ninth Plan, by 8 percent for tractors, 22 percent for trucks and 20 percent for combines.[8] The Eleventh Plan calls for a 4 percent greater tractor deliveries, 11 percent more combines and 8 percent more trucks.

Mineral fertilizers were to have increased at an annual rate of almost 10 percent in the most recent plan; actual deliveries increased at an annual rate of 3 percent. The new plan calls for a 6 percent annual growth. The plan for the 1985 year calls for 115 million tons of chemical fertilizer to be used on crops; the 1980 was also 115 million tons.

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[7] U.S. Department of Agriculture, Economics and Statistics Service, Agricultural Situation: USSR; Review of 1980 and Outlook for 1981, Supp. 1 to WAS–24, p. 23. N. A. Tikhonov in his report to the 26th Party Congress noted that the agro-industrial complex would receive nearly one-third of the total capital investment in the national economy for its development and improvement, much of this directly to boost farm production.

[8] *Ibid.* However, due to the high scrappage rates referred to above, inventories of these machines increased very little between 1975 and 1980. The number of tractors delivered was 1,805,000; the inventory increased by only 246,000 or 10.5 percent. The number of combines or grain harvesters delivered was 539,000 and the inventory increased by 35,000 or 6.4 percent. Truck deliveries were 1,344,000 and inventories increased by 10.5 percent or 147,000. The number of trucks delivered during 1976–80 were almost the same as the inventory at the end of 1975 of 1,396,000, yet the increase in inventory was as indicated. See USSR in Figures: 1979, pp. 130–31 (English edition) and 1980, pp. 122–24 (Russian edition).

POLICY CHANGES

Based on the information made available there have been no significant policy changes that would be likely to lead to a sharp favorable turn in the performance of Soviet agriculture. One trend that apparently will continue is the expansion of the industrialized livestock enterprises—large, capital intensive feeding enterprises quite divorced from the traditional collective or state farms and thus dependent upon the purchase of all or most of their inputs, including feed. The available information may be briefly summarized—these complexes produce about 12 percent of the beef and pork together and 4 percent of the milk in the socialized sector. Capital invested per head of livestock on the complexes is double to quadruple the investments on collective and state farms. And the investments per head on the ordinary Soviet farms is much greater than in the United States under similar climatic conditions. This huge investment has resulted in some reduction in feed used per unit of output, quite modest for milk but perhaps about a third for pork and beef. The labor savings have been modest for milk (about a third) and very large for beef and pork, of the order of 50 to 80 percent.

The most significant production growth rate for the past 15 years has been for poultry for which production increased by 180 percent between 1966 and 1979 while meat production other than poultry increased by less than 35 percent. But the amount of information on feeding efficiency of the broiler industry has been limited, indeed. Individuals who have visited the broiler factories in the Soviet Union believe that feed use per unit of output is significantly higher than in the United States, probably by at least 50 percent and perhaps double.

The further expansion of the livestock complexes, including broilers, during the 1980s will depend upon the availability of grain concentrates, protein meals and adequate supplies of protective materials such as antibiotics. The first will probably require expanded import levels of protein meals or oilseeds since recent performance shows a probable decline in USSR production of such necessary feeds.

At the same time the livestock complexes are being expanded there has been a renewed emphasis upon the expansion of private livestock production. In January 1981 a new decree was issued entitled "On supplementary measures for improving production of agricultural products in the private agriculture of citizens." As so often happens when agriculture is performing poorly, restrictions on the private sector are eased. The recent decree is somewhat curious in that it permits an increase in the numbers of various kinds of livestock that can be raised on private plots if there are agreements to sell the fattened animals or milk to the collective or state farms. Meat and milk output purchased in this way can be used toward collective and state farm plan fulfillment and in calculating bonuses for management. The meat and milk are to be sold at regular procurement prices, which means that the private producers must forego the much higher prices in the collective farm markets. The feed supplies and young animals are apparently to be provided by the farms. As so often happens before a policy change of this type occurs, experiments were undertaken. A similar plan had been in effect for three years in Voronezh Province. In this case, pigs were sold to the collective farm for 1.5 rubles per kilogram, a price approximately the same as the state purchase price and the concentrate feed was supplied by the farm.[9]

A second policy change involved the method for determining the required level of deliveries to the state and when the bonuses for above plan deliveries would be effective. For sales in excess of the required deliveries a bonus equal 50 percent of the procurement price is paid for most farm products. Until 1981 the bonus was determined by the level of planned procurements, a rather arbitrary figure determined for each farm primarily by the procurement agency. This policy apparently resulted in significant favoritism—a modest procurement goal was a valuable asset. Starting in 1981 the bonus was for sales in excess of actual deliveries for 1976–80.

A third policy change was related to the use of actual 1976–80 deliveries for determining the base for payment of bonus. The actual deliveries included deliveries for which bonuses had been paid. If the procurement prices were not increased, the average prices received would have fallen for many if not most farms. The base procurement prices were increased to include the prior bonus payments in calculating procurement prices for 1981 and subsequent years. In other words, the average price received for some unstated past period now becomes the procurement price to which the 50 percent bonus is added, if the bonus is earned. A fourth policy change involved additional increases in the procurement prices of a number of farm products. The increases in 1981 procurement prices are (in percent of 1980 procurement prices):[10]

Corn	26
Peas	15–36
Vetch	50
Millet	33
Rye	33
Soybeans	35
Cotton	10
Flax	13–50

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[9] G. Lisichk, "The Peasant Farmyard as an Ally of Communal Production," in Literaturnaya gazeta, Dec. 17, 1980; translation in Current Digest of the Soviet Press, XXXIII, No. 4 (Feb. 25, 1980). The chairman of the May Day Collective Farm describes the advantages of the approach: "On the collective farm's livestock sections we use 12 to 13 centners of feed units per centner of added weight. But for the animals raised in cooperative arrangements with collective farmers, we use just 4 centners. We gain space for animals in the communal livestock sections, and this space isn't cheap." The collective farm chairman was not without some self interest in the matter. He, his wife, son and daughter-in-law raised 20 pigs in one year on 0.15 hectares of land and earned 3,000 rubles. And he indicated that he thought he could increase his income to 5,000 rubles by increasing the number of pigs raised to 35. In an article translated in the same issue of the Current Digest of the Soviet Press that consisted of questions and answers on the degree on private livestock, it was stated that for the RSFSR it was anticipated that 8 million pigs and 300 million young fowl would be produced in this manner in a year. It was noted that the feed would be supplied by the farms. It was also indicated that credit of up to 3,000 rubles for up to 50 percent of the cost of constructing facilities on the private plots for raising livestock to be sold to the farms was to be made available. The number of livestock that families will be permitted to have appears to be quite substantial, if the above example is at all a realistic one. The difference in feed used between the collective farm and the collective farmers should not be accepted as a realistic estimate of the total amount of feed actually used in the two settings. The figures may refer to the amounts of feed used on the collective farms and the amounts sold to the members who supplemented the amount given with feed acquired from other sources.

[10] *Sel'skaia Zhizan*, February 12, 1981. The new soybean price is 350 rubles per ton. The farm price of soybeans in the United States in April 1981 was about $225 per ton.

Milk prices were increased an unspecified amount. The increase in milk prices followed a significant increase in 1979. These two types of price increases should have some positive output effects, though the increases may represent little more than catching up with past cost increases.[11]

A fifth change instituted was that starting in 1981 procurement agencies are to be responsible for all transportation and procurement costs. It is not clear how much this will increase the net prices received by farmers but for farms located some distance from procurement points the savings could be substantial.

Except for the increased emphasis upon the industrialized livestock complexes, the policy changes that have been introduced recently will have a positive effect of farm output. The calculation of bonuses on procurement on the basis of past deliveries rather than the procurement plan represents an improvement and reduces arbitrary decisions by the procurement agency. The decree encouraging more livestock production on the private plots if the products are sold to the collective farms should have a modest output effect. Finally, the increase in prices for some farm products as of the beginning of 1981 may have done little more than offset past cost increases but even so represent a positive change.

PROBABLE OUTPUT ACHIEVEMENTS

As is well known the Eleventh Plan has gotten off to a poor start in agriculture. The 1981 grain crop was 160 million tons or more than 75 million below the 1980 goal established in the Tenth Plan. Meat production in 1981 at 15.2 million tons was only 3 percent above the average for the previous plan. Milk production declined in 1981 while egg production increased at a rate consistent with the plan. It is now clear that few of the output goals for 1981–85 for agriculture will be met. In fact, the record may well be more dismal than for 1976–80.

But even prior to the poor 1981 crop and livestock year it was highly probable that neither the grain nor livestock goals would be met. In an earlier version of this paper, written in spring 1981 before there was any knowledge of the 1981 crop output, I had concluded that the goals "for grain and livestock appear to me to be too high, not outrageously so but perhaps by 4 or 5 percent." Thus grain production was projected to increase 12 to 13 percent or to approximately 229 million tons or more than 10 million tons below the goal for the five years.

As noted earlier, even if grain production were to meet the plan goal, meeting the livestock goals would require more grain than the plan goal. During the Tenth Plan Period grain used for feed increased by 28 percent and livestock output increased by no more than 8 percent. The Eleventh Plan goals call for a nearly 12 percent increase in all livestock output. If the incremental relationship between grain fed and livestock output increase during the Tenth Plan continued for the current plan, achieving the livestock goals would require about 42 percent more grain than was fed in the Tenth Plan. This relationship would imply that the 1981–85 livestock goals, if fulfilled, would require 50 million tons more grain than was actually fed during 1976–80. Some may argue that this is a very large increase in grain fed for a rather small increase in output. Two points can be made in support of the projection. First, almost all of the gain in meat, milk and egg prodution made possible by reducing grain and other concentrates to horses has now been realized, and, second, the amount of grain fed per unit of livestock output has increased sharply over the past 15 years. I referred above to the much greater percentage increase in grain fed than in livestock output during the 1970s. A similar calculation comparing 1971–75 with 1966–70 indicates that an 18 percent increase in livestock output was associated with a 48 percent increase in grain fed. The projection of grain used for feed assumes that there will be no further increase in the amount of grain used to produce a unit of livestock output.

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[11] These two new forms of price increases will involve substantial budgetary costs. The previous bonus system provided payments averaging 3 to 3.5 billion dollars; presumably about this amount was added to the base procurement prices. The new bonus system has been estimated to increase farm incomes by 4 billion rubles. The two changes here in prices paid to farms will result in an increase in agricultural price subsidies of as much as 7.5 billion rubles in 1981 compared to 1980. Thus total agricultural output price subsidies might be as much as 35 billion rubles in 1981.

Even if the grain goal of 239 million tons were met, this would fall short of estimated requirements by at least 35 million tons. If the livestock goals were to be met the shortfall would have to be met either through grain imports or increased supplies of other feeds.

However, it now appears that the low grain output in 1981 will mean that grain production for the plan period will fall well short of the goal. In fact, it will take very favorable weather for the last four years of the plan period to achieve an average level of 205 to 210 million tons. Thus for the current plan period, even with a very high level of grain imports of perhaps 150 million tons for the five years, feed supplies will be inadequate to meet the livestock output goals.

More grain alone will not be enough to permit meeting the meat goal. The output of fodder crops must increase significantly and more high protein feeds, such as the oilmeals, must be provided. Oilmeals must be imported if availability is to be increased significantly during the current plan period. The plan goals for hay, haylage (hay cut green and fed immediately) and silage are beyond any achievable level.[12] If the 1985 goals for these sources of feed have been used in estimating the available feed supply, the livestock goal will not be met. While it appears to be true that livestock inventories have not been reduced due to the poor 1979 and 1980 grain and feed crops, probably all feed inventories have been. Thus for at least the first year or two of the plan period rebuilding grain and feed inventories will compete with the increase in livestock production. Stock rebuilding could require as much as 20 to 25 million tons of concentrates. I believe that it will be difficult to increase meat output by as much as 10 percent during the Eleventh Plan or to more than 16.4 million tons.

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[12] Recent output levels and the 1985 goals are given in U.S. Department of Agriculture, Economics and Statistics Service, Agricultural Situation: USSR; Review of 1980 and Outlook for 1981, Supp. 1 to WAS–24, April 1981, p. 5. The 1985 goal for hay is 48 percent greater than 1980 output; for silage 61 percent. The goal for haylage calls for only 13 percent increase but this source of feed is much less important than either hay or silage.

But even if the plan goal of 17.25 million tons were met, per capita consumption would not exceed 64 kilograms of meat and fat and 53 kilograms of meat. This would give little relief to the harrassed Soviet consumer who now finds almost no red meat in the state stores. This small an increase, assuming a continuation of present policy, would result in no noticeable change to the Soviet consumer that did not have special access to meat, such as at the place of work.[13]

The goal for gross agricultural output of a 12–14 percent increase is not likely to be attained. How large the shortfall may be will depend primarily upon the distribution of climatic factors during the five years. But even with very favorable weather for the last four years, it will be difficult to meet the output goal with average weather the shortfall would be significant, perhaps of the order of 5 percent.

There are some positive elements in recent discussions, including those of the Eleventh Plan, that should be noted. Emphasis is to be given to feed crops other than grain: A great increase (60 percent) in investment is planned to increase storage capacity and reduce post-harvest losses and to cut the losses in fertilizer between production and the farms. Priority is to be given to improve the quality of farm machinery and of fertilizer production and distribution. And farms are to be given greater discretion in their own management, with Moscow to restrict its interventions. True, most of these things have been said or promised before. It is possible that this time some positive moves will occur. If so, it would be possible to reduce the output shortfall that I have projected by as much as a third during the current plan.

OUTPUT PROSPECTS FOR THE TWELFTH PLAN PERIOD—1986–90

Agricultural output growth during the 1970s was at the very slow rate of 1.2 percent annually. And almost all growth occurred by 1977. Some may consider my output projection of an 8 percent increase for 1981–85 over 1976–80 as unduly pessimistic. But even the annual rate of increase of 1.55 percent is greater than the growth rate for the 1970s. Even if output growth increases further to 2 percent annually, agricultural output for the last half of the

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[13] Moscow News, and English language weekly (No. 23, 1981) carried a full page article on the meat and milk situation in the USSR by Lev Voskresensky. The article starts with the following provocative question: "Why is the USSR having difficulties with meat and dairy products production?" His main argument was the demand was growing too fast, though he does not note the near absencc of any per capita supply growth after 1975. But he makes two interesting points. One is that a significant part of the meat supply goes around the state food stores and therefore the supply in the stores is not an adequate indication of the meat supply. He notes the expansion of the public catering network and that many enterprises "also have food order systems." Thus some workers can purchase food at their place of work: "Of course, certain people are bypassed by these channels of food distribution * * *" (p. 12).

Another factor the author notes is that prices are not a barrier to increased demand. After noting that meat and milk and other subsidies cost 26 billion rubles (the figure for 1980 is 30 billion rubles of which all but 1.5 billion rubles was for food products) he wrote: "Economists can argue endlessly and make as many declarations as they please about the expediency of the current system of subsidized low prices, but the pricing policy is not going to change. Keeping strictly to this policy, the state travels from the premise that the growing demand for livestock produce is a justifiable phenomenon."

In a visit to the Alma Ata and Tashkent in June 1981, meat was plentiful in the collective farm markets at prices double or more than in the state store: 6R for lamb, 5R for beef and 4R for pork (per kilogram). But I saw no fresh meat in the several food stores that I visited except for about ten hog heads. When sausage was available, there were lengthy queues.

1980s would be approximately 19 percent greater than the last half of the 1970s. On a per capita basis the increase in output would be somewhat more than 10 percent.

But if one looks at the problem commodities—livestock products, especially meat—the last half of the 1980s holds out rather little hope for a striking improvement in per capita meat consumption. And, unless retail prices are increased significantly, meat will continue to be unavailable in the state stores. More and more of the meat will move through distribution schemes operated by firms and bureaucracies. The remaining meat will move primarily through the collective farm markets and the ratio of prices of meat in such markets to the fictitious state store prices will continue to widen, perhaps to as much as 3 or 4 to 1 by the end of the decade. Even by the end of the 1980s it is unreasonable to project per capita meat consumption (Soviet definition) of more than 70 kilograms.

CONCLUDING COMMENTS

I see no evidence that there will be significant improvements in the basic performance indicators of USSR agriculture during the 1980s. Agriculture will continue to be high cost, requiring a high percentage of national investment, increasing levels of nonfarm inputs, and a large and growing annual budget drain to cover the shortfall in the value of retail sales compared to payments for farm output plus processing, transporting and marketing costs. Continued high levels of grain and feed imports will be required if any progress is made in increasing per capita meat production.

If the food price subsidy policy is continued for another five years, and it seems very likely it will be, no progress will be made toward reducing the gap between demand and supply at the state store prices during the first half of 1981. In fact, it is almost certain that the gap will be enlarged bringing with it a wider disparity between prices in the collective farm market and the state stores and longer queues at the state stores. Presumably there will come a time when the demand-supply gap becomes so large that it can no longer be tolerated. But, and Soviet officials must understand this, the larger the gap is permitted to become the more difficult it will be to eliminate it.

USSR: PRIVATE AGRICULTURE ON CENTER STAGE

By Ann Lane*

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I. SUMMARY

Successive poor years in Soviet agriculture have impelled the leadership to again encourage private agricultural activity. In January, 1981 the Central Committee and Council of Ministers released a decree aimed at increasing private agricultural production, particularly of meat. But the decree of January 1981, like its predecessor of 1977, is not likely to overcome the numerous problems hindering private sector farming.

Soviet policy-makers historically have made concessions to private agriculture in the spirit of practicality over ideology, viewing private agricultural activity as a temporary means of compensating for shortfalls in socialized agriculture. Private agriculture in fact plays an important role in the supply of food to the Soviet population. About one-fourth of the gross value of agricultural production, including 30 percent of the meat production, comes from this sector. But a high degree of interdependence exists between private and socialized agriculture so the private sector is vulnerable to many of the same difficulties affecting the socialized sector.

More recently, in the decrees of 1977 and 1981 the leadership has explicitly acknowledged the dependence of the private sector upon socialized agriculture, calling upon collective and state farm managers to make resources available to private producers. A novel aspect of the 1981 decree is the official sanction granted to the previously experimental contract system under which farm managers sell or supply young animals and some feed to private producers, who later sell back the mature animals to the farms. Private producers, however, are still the last claimants upon state agricultural resources. Feed for livestock is in short supply, and will remain so in the 1981–85 plan period as farm managers try to meet higher meat production targets.

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Other factors will also retard the performance of the private agricultural sector: declines in the rural population and the agricultural workforce, the narrowing gap between rural and urban wages, the declining interest of rural residents in performing manual labor, the lack of small mechanized equipment, and the poor rural transport and marketing structures.

Certain parts of the new decree on private agriculture represent an attempt to incorporate, in diluted form, aspects of the private agricultural system prevailing in Hungary. The Soviet leadership is impressed by the performance of the private agricultural sector within the Hungarian system of socialized agriculture. But far reaching changes within the Soviet agricultural system as a whole will be necessary to allow private agriculture in the USSR to operate as effectively as it does in Hungary. The Soviet leadership does not appear inclined toward such measures.

Private sector agriculture turned in a mixed performance in 1981, the first year of the new decree. Private meat production stagnated at about the 1980 level of 4.6 million tons; meat procurements by the state from the private sector were substantially below the 1980 level, a trend which has continued in 1982. However, private herd inventories grew slightly.

II. INTRODUCTION

Early in 1981 the Soviet press carried a summary of a new decree supporting private agricultural activity. Following upon the heels of two back-to-back poor years in agriculture and attendant shortages of both quality foods and some staples, the decree, which includes some innovations, was aimed at boosting food output, and rural self-sufficiency.[1]

Private agriculture in the Soviet Union is carried out on some 34 million small plots of land, up to 0.5 hectares in size, allocated by the state for individual use.[2] In addition, families usually keep a few head of cattle or pigs and a small flock of poultry. For most people with private plots, private agricultural activity is a secondary occupation and is highly labor intensive.[3] Although the private agricultural sector produces roughly one-quarter of the gross value of agricultural output, its economic significance cannot be measured by share of production alone. Because the state-operated system for processing and marketing perishable foodstuffs is highly inefficient, low quality and shortages of state-supplied perishables are chronic. Therefore, Soviet consumers rely either on their own plots or on direct purchases from private producers for a major share of their consumption of quality vegetables, meat, dairy products, and other highly perishable produce.[4]

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[1] The grain harvests of 1979 and 1980 were 179 and 189 million metric tons respectively, well below the 10th Five Year Plan average of about 205 million metric tons; in 1981 it was an estimated 160 million metric tons. The potato harvest in 1980 was 67 million metric tons, the lowest since 1951 and was only slightly better in 1981. The major shortfall in this crop, often referred to as "the second bread", affected the livestock sector, since about 30–40 million tons, or about 40 percent of an average potato crop, is normally used for livestock feed.

[2] Private plots are held by some 13 million collective farm families, over 10 million families connected with state farms, and more than 10 million families of workers and employees in other sectors of the economy. Voprosy ekonomiki, No. 5, 1981, p. 68. One hectare equals 2.471 acres.

[3] The agricultural productive fixed capital of the private agricultural sector at the beginning of 1980 was 4.6 percent of total agricultural productive fixed capital (in 1973 prices).

Since the end of the Stalin era, policy support for private agriculture has followed an on-again, off-again pattern. When the socialized sector has faltered, the leadership has relaxed restrictions on private agriculture; conversely, when the socialized sector has evidenced signs of recovery and stability, Moscow has abandoned campaigns to boost output from private agriculture. In 1977 the leadership issued a decree in support of private agriculture. The 1975 harvest of 140 million tons fell short of the target by 75 million tons, resulting in a sharp drop in meat production in 1976.

The year 1978 saw a record harvest and a considerable diminution of the leadership's promotion of private agriculture. In 1979 total meat production dropped one percent; in 1980 it fell by 3 percent, resulting in a per-capita drop of 4 percent. The state retail sector for food is in large-scale disequilibrium; shortages of meat, dairy products, and other foods have reached serious proportions.[5] Thus, the leadership's centerpiece in its consumer program—improving the diet—has already suffered a reversal. Once again, private agricuture is in the spotlight. This paper examines (a) the trends in private agricultural production since 1964; (b) the 1981 decree with its adaptations from the Hungarian system; and (c) the factors affecting the private sector's performance.

III. RESOURCE USE IN PRIVATE AGRICULTURE

Since Soviet agriculture was collectivized in the 1930s private agriculture has continued to coexist with the public sector, albeit in an uneasy ideological setting. The ascendancy of practicality over ideology is due to the fact that private agriculture has harnessed land and labor which the public sector has not managed to fully utilize, in the process playing a substantial role in the production of food.

But past progress in private agriculture has been uneven. After a surge in output following Krushchev's political demise in 1964, output in the private sector has stagnated since 1973 (see Figure 1). The production of the six basic commodities comprising the bulk of private sector output—meat, milk, eggs, potatoes, vegetables, and wool—has leveled off or dropped since the mid-1970s. The proportion of private agricultural production in total farm output has been declining steadily, from 31½ percent in 1965 to less than 25 percent in 1979.[6] The private sector shares in meat and milk—key

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[4] For example, private plots supply to collective farm households about 75 percent of their meat, milk and vegetable consumption, and nearly all of their potato and egg consumption. Ekonomicheskie nauki, No. 2, 1981, p. 72. Overall, the gross production from the private sector is used in the following way: 56 percent of production goes for the personal consumption of the household producing it, 20 percent is used for seed and livestock feed, and 24 percent is sold. P. Ustimenko and A. Yakovlev, Sotsial'nye voprosy razvitiya sela, Moscow, 1981, p. 45. The last of the cited figures can be independently verified.

[5] Over 90 percent of food sold is through state controlled outlets at set prices. At collective farm markets, where private producers sell their surplus, prices vary according to supply and demand, and are now between two and three times those in state outlets. The gap between supply and demand for quality foods has widened because of a continued rise in disposable money income and the official policy of holding retail prices at relatively low levels in state retail outlets.

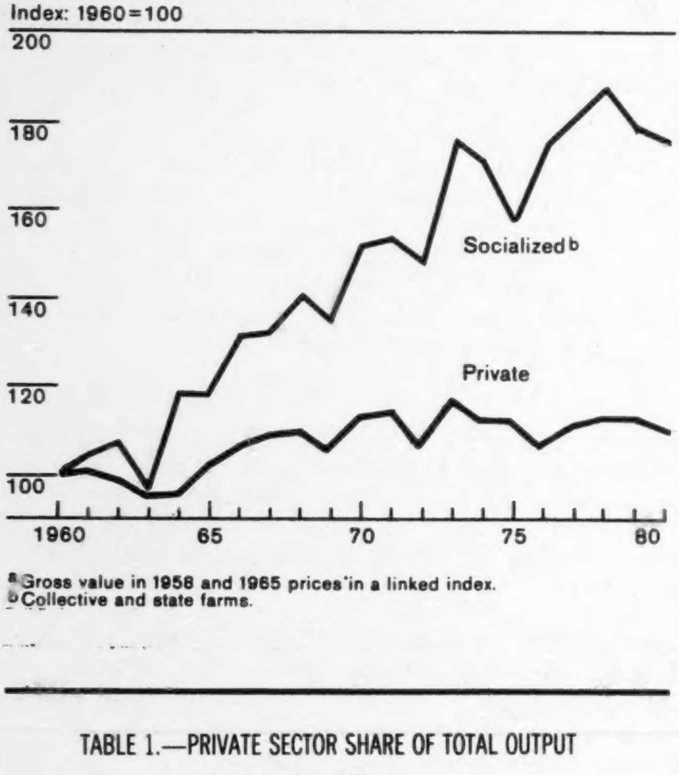
[6] Measured in terms of gross value of output through a series of linked indexes. Gross value includes agricultural output used by the agricultural sector, such as feed and seed, which would

Continued

foods essential to the improvement of the Soviet diet—have also declined gradually in the last decade and a half (see Table 1). Private output as a share of both livestock products and crop products has been falling steadily.[7]

Figure 1

USSR: Farm Output by Sector[a]



[a] Gross value in 1958 and 1965 prices in a linked index.
[b] Collective and state farms.

TABLE 1.—PRIVATE SECTOR SHARE OF TOTAL OUTPUT

[In percent]

	1965	1970	1975	1980
Meat	40	35	31	31
Milk	30	36	31	30

Source: Narodnoye khozyaystvo SSSR, various years.

Inventory figures for privately held livestock also indicate the dwindling role of the private sector. The private share in the total number of livestock (cattle, pigs, sheep, and goats) dropped from

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be excluded under a net value calculation. See Ekonomicheskie nauki, No. 2, 1981, p. 73 for a Soviet estimate of private sector GVO in 1966–70, 1971–75, and 1976–77.

[7] During 1966–70 private output was 38.6 percent of total livestock production, declining to 34.4 in 1971–1975, and to 31 percent in 1976–1970. During 1966–1970 private output was 21.8 percent of total crop production, declining to 20.6 percent in 1971–1975, and to 18.5 percent in 1976–1980. Ekonomicheskie nauki, No. 2, 1981, p. 72.

one-fourth in 1971 to one-fifth in 1981.[8] The brief effect of the 1977 decree shows up in the yearly totals for 1977 by animal category (table 2). By the end of 1978 private herd inventories, with the exception of hogs, had shrunk slightly, despite the record grain harvest of 1978. Herd inventory numbers in 1980 show that most categories of private livestock continued their gradual decline.

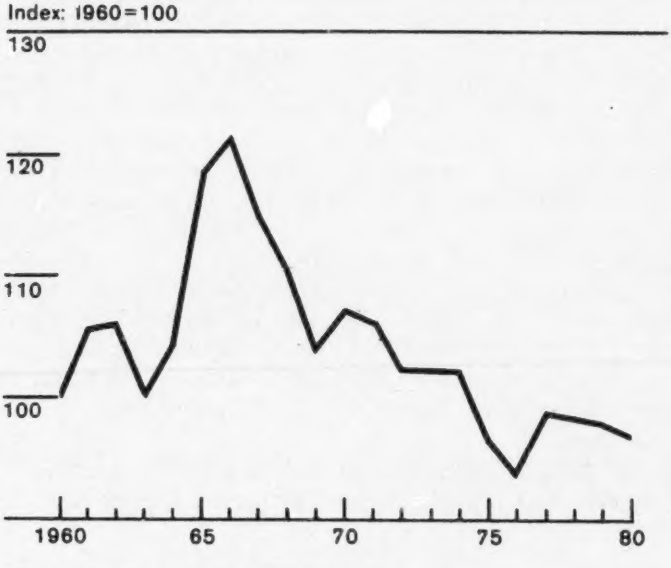
TABLE 2.—PRIVATE HERD INVENTORIES

[In millions at year end]

	1970	1975	1976	1977	1978	1979	1980	1981
Cattle	25.0	23.5	22.8	23.3	23.1	23.1	23.0	23.3
Cows	15.5	13.7	13.4	13.4	13.3	13.2	13.2	13.3
Pigs	16.5	12.2	11.8	14.8	14.8	14.6	14.3	14.2
Sheep and goats	33.2	29.4	28.8	29.4	29.2	30.2	29.2	30.2

Sources: Narodnoye khozyaystvo SSSR, various years.

Figure 2
USSR: Value of Livestock in Privately Owned Herds[a]



[a]Constant 1970 prices. End of year data.

The private sector's share in acreage devoted to crops, vineyards, and orchards has dropped as well, from 5.0 percent in 1970 to 3.5

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[8] Narodnoye khozyaystvo SSSR, 1970, 1979. Livestock figures as of January 1, 1971 and January 1, 1981.

percent in 1980.[9] Here, too, the decree of 1977 appears to have had little effect in maintaining the private agricultural sector's share in direct resource use.

The fundamental problem is that private farmers grow only a small amount of the feed needed to maintain their livestock. About 60 percent of total grain supplies in the USSR is used to support livestock, yet only 1 percent of the total crop is produced by the private sector. The private sector also depends heavily upon the socialized sector for roughages. Except for potatoes,[10] only a small amount of forage is grown on private plots; hay, straw, green fodder, and silage come from the socialized sector.

Besides the acreage directly under the control of households, the private sector has access to certain land controlled by the socialized sector for pasturing privately owned livestock and harvesting hay. If all of the area in the socialized sector that directly or indirectly produces feedstuffs for the private sector is added to the relatively small area directly held by households, the total area given over to supporting private farming comes to roughly 119 million hectares, or nearly 20 percent of all the arable land in the USSR. Feedstuffs (grain, silage, hay) are received as payment-in-kind for participating in work on collective or state farms. Theft or "misappropriation" of feedstuffs is not uncommon.

Private individuals raising livestock and poultry also rely heavily upon bread and other cereal products as a livestock feed. One Soviet scholar estimated that the amount of bread products consumed as feed in 1975 amounted to between 5 and 6 kilograms per capita of population, or 1.4 million tons of bread.[11] This represents about 4 percent of bread and grain products sold that year.[12] This practice, albeit illegal, occurs not only because feed is in short supply but also because it is a highly economic way of feeding animals. The long-standing imbalance in the price of bread in state stores and livestock products in the free market consistently has induced individuals to feed bread to livestock. Table 3 sets forth the relationship in relative prices that has led to the widespread use of bread for feed. Because bread prices have been maintained by the state at the same level while prices of livestock products in the free market have been rising, there has been an increasing incentive to buy bread for feeding.

Restrictions on private agriculture are now relatively relaxed. The confiscation of privately owned animals, the prohibition on the

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[9] In addition to area used for crops, vineyards and orchards—in 1970, 10.37 million hectares and in 1980, 7.82 million hectares—private farmers are directly allocated some wild grassland, which in 1980 amounted to .62 million hectares. (Moscow News, No. 49, 1980.)

[10] The private sector's share in potato production was 59 percent in 1979 (65 percent in 1970).

[11] P. A. Lokshin, Spros, proizvodstvo torgovlya (Moscow: Ekonomika, 1975), p. 91. The Ministry of Trade calculated a higher but unspecified figure.

[12] The practice of feeding bread to livestock probably accounts for some of the occasional disruptions in retail supplies of bread in rural areas. From time to time public campaigns are employed to denounce the practice of feeding animals cereal products sold in state retail stores.

TABLE 3.—USSR: RATIO OF FREE MARKET PRICE OF LIVESTOCK AND POULTRY TO COST OF RYE BREAD REQUIRED FOR THEIR PRODUCTION [1]

	1966	1970	1975	1981
Pork	1.79	2.31	3.17	3.91
Beef	1.73	1.70	2.33	2.48
Poultry	3.65	6.76	6.99	8.76

[1] Prices of meat based on average Moscow collective farm market prices of January, February and March.

keeping of livestock and poultry in towns and settlements, and legal restrictions on the private sector's access to feed have been ended by the Brezhnev regime.[13] Therefore, the problem of encouraging the private sector hinges less on such passive support as fewer restrictions than on active economic support—that is, the consistent provision of adequate supplies of agricultural resources, particularly feed for livestock.

IV. PROVISIONS OF THE JANUARY 1981 DECREE

The new decree, like the 1977 decree, criticizes local officials and state and collective farm managers for not encouraging private agricultural activity, especially the raising of livestock. Indeed, in many respects it repeats the substance of the older decree; in two ways, however, it makes an innovative departure: (a) it ratifies and recommends the contract method of raising livestock,[14] and (b) it removes restrictions on the number of livestock held by individuals for livestock being raised under contract, (that is, if the livestock is to be resold to the socialized sector).[15] The basic regulations on land, which permit up to 0.5 hectares for personal use, remain in force.[16] Thus the decree maintains the basic controls over the private sector, while linking some private activity more closely with the socialized sector. Also new is the provision allowing state farms, collective farms, and other state agricultural enterprises to grant young livestock free of charge to newly-formed families. This clause is aimed at inducing young people to stay on farms.

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[13] In October 1964 following the removal of Khrushchev the Central Committee issued the decree "On the Removal of Unjustified Limitations on the Private Plots of Kolkhozniks and Workers." A month later the tax on livestock owned by urban residents was repealed. Other legal restrictions on livestock holding by the non-collective farmer population were also removed. In December 1964 the State Bank was authorized to extend loans to collective farmers and state farm workers who did not own a cow and who wished to purchase a cow or calf. Subsequently, restrictions on the sale of feed to private livestock owners were removed. The new Land Code of 1968 and the Model Collective Farm Charter confirmed the restored norms on private land use. Beginning in 1970 collective and state farms and other agricultural enterprises were allowed to sell young animals to individuals.

[14] The practice of sales from private individual to farms based on a fixed delivery contract goes back at least to the early sixties, but only on a small scale. Karl-Eugen Wädekin, The Private Sector in Soviet Agriculture, 1973, pp. 245–6.

[15] A complex set of regulations governs the private holding of livestock. Regulations differ for four basic categories: collective farm members, wage and salary workers in rural areas who are engaged in agricultural occupations or in occupations connected with agriculture, wage and salary workers in rural areas who are not engaged in occupations connected with agriculture, and wage and salary workers in urban areas. In addition, the regulations vary considerably by locale. In general, the most liberal rules apply to collective farm workers; the Model Collective Farm Charter of 1969 sets the upper limits as: "One cow with calves of up to one year, one calf of up to two years, one sow with piglets to up to three months or two hogs for fattening, (and) up to ten sheep or goats" as well as an unspecified number of beehives, poultry, and rabbits.

[16] The average size now of private plots of collective farmers is .31 hectares; of wage and salary workers in rural areas, .17 hectares; of state farm workers, .21 hectares; and of urban workers and employees, .07 hectares. Voprosy ekonomiki, No. 5, 1981, p. 68. Less land is being allocated and used than the regulations allow; for example, collective farmers are entitled to .5 hectares, and state farm workers, .3 hectares, according to the USSR Land Code.

The decree repeats and expands a number of provisions of the 1977 decree. For example, up to 50 percent of the loan granted to individuals to purchase cattle can be forgiven. The 1977 decree allowed a loan of up to 500 rubles for purchase of cows (up to 250 rubles for calves).[17] The new decree increases the amount of credit advanced to individuals for improving private acreage, while easing repayment terms. Under the 1977 decree, loans for improvement of private plots of up to 1,000 rubles, repayable in five years, were permitted; now improvement loans up to 3,000 rubles repayable over 10 years starting the third year after being received, are allowed. Again farms are urged to supply more feed, make available more socialized land for grazing, haying and raising of feed, and provide more assistance to individuals in marketing their produce.[18]

The contract system is voluntary and therefore depends upon the interest of individuals and farm managers. Socialized farms are supposed to provide young animals, feed, and veterinary and other services and in turn are allowed to include products obtained under contract towards their own plan fulfillment targets. Terms of the contracts such as prices individuals pay for the young animals and the amount and price of feed to be provided by the farms—as well as the buy-back prices—are to be negotiated on an individual basis.

Two basic arrangements involving feed allotments and buyback prices are used in experimental contract systems now in operation (in almost all the experimental systems described the individual buys the young animal at the state purchase price per kilogram and becomes the legal owner):

Option 1.—The farm supplies the individual a portion of the necessary feed at cost (the price the farm pays the state for the feed). The individual must obtain the rest of the necessary feed himself. The buy-back price is generally set at or somewhat less than the state purchase price.

Option 2.—The farm supplies a portion of the necessary feed free of charge. Again, the individual must obtain the remaining feed necessary to raise the animal to the weight specified in the contract. The buy-back price is low, about one-fourth to one-half of state purchase prices. Sometimes the deal is made more attractive by allowing the private producer to keep a portion of the livestock. For example, if five or more pigs are raised, the private producer might be allowed to keep one. Occasionally the private producer is allowed to keep 30 percent of the poultry he raises. However, in such cases the portion of feed allotted per animal is generally lowered.

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[17] The loan for buying a cow—500 rubles—is roughly equivalent to 70 days wages for a state farm worker. The purchase price of a cow is roughly 1,000 rubles. Kolhozes, sovkhozes, and other agricultural enterprises generally do not help the population in purchasing calves or cows unless the individual also agrees to sell an older animal to the farm. The prevailing incentive structure provides relatively high rewards for increases in sales to the state while at the same time meeting herd inventory targets.

[18] As explained in Planovoye khozyaystvo, No. 8, 1981, the intent of the decree is that farms should give hayfields and pastures to individuals for long-term use to increase individual interest in improving land, and USSR and union republic land-use codes have been revised accordingly.

V. OUTLOOK FOR THE CONTRACT SYSTEM

The success of the contract system of raising livestock will be affected above all by the overall availability of feed. The private sector's heavy dependence upon the public sector for resources—most importantly, feed for livestock—means that swings in socialized production reverberate into the private sector with even greater force. Thus, shortages of feed in the public sector tend to hold back the private sector precisely at those times when the Soviet leadership is most inclined to encourage the private sector.

Because the decree leaves contract negotiation to farm managers and individuals, the decree could be thwarted at the ground level. If the system is to work, both farm managers and private producers must perceive clear advantages. However, a number of crosscurrents render relative advantages difficult to predict.

For farm managers, the strongest incentives to enter contracts is the ability to count livestock obtained under contract toward procurement targets. Another incentive is the greater care that individual animals would receive in the hands of private producers and the reduction in animal mortality that would likely ensue. The greatest disincentive is risk in providing resources—feed supplies and young animals—to individuals who might not return the results of their labor to the farms, despite the financial penalties for which the individual would be liable. The penalty which the individual pays to the farms for failure to return the mature animal, however, would not compensate the farm manager for loss of the animal to count toward plan fulfillment. Thus, farm managers may be loath to extend cooperation to individuals by providing young animals and feed.[19] When feed shortages are as severe as they are now, this disincentive will be particularly strong and, managers will be more inclined to spend resources on the animals over which they have direct control. If pressured by local officials to set up contracts, they may fail to fully supply the quantity of feed for private use that is stipulated in the contracts.

For the individual the strongest incentive to enter into a contract is the prospect of a guaranteed feed supply.[20] Without this, the private producer would be better off to expend the considerable effort necessary to obtain feed, slaughter, and dress the animal, and sell the meat at a collective farm market (CFM), where prices are considerably higher than state purchase prices. Details of experimental contract systems published in the Soviet press indicate that farms are making available to private producers under contract less than half, often only one-third, of the feed units necessary to raise animals.[21] Private producers therefore still must rely on their own efforts and finances to obtain the remaining feed.

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[19] As the decree of 1981 underscores. Party Secretary Kiselev of Belorussia recently admitted that farm managers "view private plots as a burden". A recent report from Omsk where a campaign to encourage private meat production began five years ago described the "indifference" and "active opposition" of farm managers to privately owned livestock. In the fall of 1980 at a round-table discussion of the problems of private agriculture conducted by the All-Union USSR Trade Union, the Central Committee of the USSR Union of Agricultural Workers, and the Regional Trade Union Councils of Belorussia, the participants pointed out the reluctance of farm managers to share pastureland, blaming the fact that many collective and state farms do not have sufficient pasturelands for their own animals. Sovetskaya Belorossiya, 12 November 1980; Sovetskaya Rossiya, 1 March 1981; Trud, 11 October 1980.

[20] Feed and other shortages have put stress on small-scale animal husbandry. Recently the Moldavian Union of Consumer Cooperatives surveyed private plot holders to determine why they kept no livestock or did not increase their holdings. Forty-five percent blamed the lack of feed, 25 percent cited a lack of necessary space and equipment, 25 percent named the difficulty in acquiring young stock, and five percent named a lack of time or poor health. Sovetskaya Moldaviya, 10 March 1981, p. 2.

It appears that the practice of supplying less feed than is necessary to raise animals stems not only from feed shortages but also from the judgment that private producers are already obtaining a large part of the necessary feed units from state resources. In a recent article,[22] an academic argued that when one takes account of the large amounts of bread acquired through state stores and of concentrated feed acquired through theft, the feeding efficiency attained by the private sector in poultry raising is in reality less than that of the public sector; to provide more concentrated feed to private producers under contract would be inefficient.

In addition to the feed supply problem, the profit which a private producer might make under the contract system tends to be low, especially when contrasted with the profits derived from CFM prices. Some of the contract systems, however, allow a private producer to keep some of the contract livestock for himself. This added inducement may be enough to lead him to want a contract since meat shortages are likely to continue. On the other hand, most farm managers probably are less than enthusiastic about the prospect of supplying grain for animals not eventually returned to the farm.

Deputy Gosplan Chairman Ryzhkov recently emphasized that the fate of the contract system depends on this balance of incentives, stating at the 26th Party Congress that help to the private sector is to be a "voluntary" program and cannot be incorporated into the plan. Nevertheless, some targets have been made part of the plan; in 1981 more young animals were to be sold to the population than in 1980,[23] but the amount of mixed feed to be sold was to remain at the 1980 level.[24] Thus, while plans called for increases in the number of young animals provided, they did not provide a concomitant increase in mixed feed supplied.[25] The sale of young animals to the population has been expanding rapidly. In 1980, 14.8 million young pigs and 570 million young poultry were sold to the population compared with only 8.6 million young pigs and 337 million young poultry in 1976.[26] Plans call for the sale of 17 million young pigs to the population, and 1 billion young poultry in 1985.[27] The success of these plans will depend upon the ability of the regime to expand livestock herds, and to fulfill plans for feed production.

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[21] Based on actual state and collective farm feed conversion ratios.

[22] Sel'skaya zhizn', 30 May 1981, p. 2.

[23] Zhivotnovodstvo, No. 1, 1981; Ekonomika sel'skogo khozyaystva, No. 1, 1980.

[24] This amount of mixed feed (3.5 million tons) is about 70 percent short of what is required to raise the pigs or about 30 percent short of what is required to raise the poultry planned for sale in 1981. However, individuals are supposed to receive other types of feed as well through the farms.

[25] In 1975 the Ministry of Trade estimated that demand for concentrated feed sold through state and cooperative retail outlets was 7 million tons, in contrast to the 3 million tons allocated. Spros, proizvodstvo torgovlya, p. 91.

[26] Planovoye khozyaystvo, No. 8, 1981.

[27] Khozyaystvo i pravo, No. 6, 1981; Ptitsevodstvo, No. 1, 1982. Sales of cattle to the population were .9 million in 1980. Ekonomicheskaya gazeta, No. 25, 1981.

VI. OUTLOOK FOR FEED SUPPLIES

After three years of poor grain harvests, feed supplies are tight.[28] Above normal slaughtering occurred in the early months of 1980, and reports continue to surface that feed supplies are excruciatingly short in many areas. These shortages are likely to persist over the next five years. Annual average meat production planned for 1981–85, 17.0–17.5 million tons, represents an increase of more than 15 percent over the annual average of 14.9 million tons achieved in 1976–80.[29] The Soviets will likely fall short of their highly ambitious target for annual average grain production, which represents a sizable increase of 17 percent over annual average production in 1976–80.[30] Although the 1981 grain harvest figure was not announced on schedule, the harvest was at least some 65 million tons below target, meaning that plans for the 1982–85 harvest will be more difficult to achieve.

Such taut planning means that farm managers are not likely to have the feed supplies necessary to render more assistance to private producers. Ukrainian Party Secretary Scherbitskiy has warned that even if grain production targets for the next five years were met, the republic would still not have enough grain to reach meat production targets given the current feed conversion ratios.[31] Feed shortages, moreover, exacerbate the tendency of farm managers to hoard resources. Plan targets are generally set by increases over the achieved level; thus, the farm manager knows that next year he will have to produce more and will be inclined to husband resources. In addition, plan targets are frequently increased, and managers know that it is prudent to keep extra supplies on hand to meet new targets or to barter with other farms for various resources. In an attempt to introduce more stability into local planning, the yearly plans for the five-year period, set at the beginning of the five-year period, are not supposed to change; neither are figures for delivery of supplies.[32] Given the past record of changes in

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[28] According to official statistics, less feed was used in 1980 than in 1977. Feed units (in centners) expended per "standard animal unit" dropped from 27.3 in 1977 to 25.7 in 1980. Yet feeding efficiency apparently has not improved. Between 1975 and 1979 feed conversion ratios, with the exception of cattle on collective farms, have worsened. (A feed unit is defined by total digestible nutrients contained in a unit of oats.)

CENTERS OF FEED UNITS PER CENTNER OF WEIGHT GAIN [1]

	Cattle		Hogs	
	Collective farms	State farms	Collective farms	State farms
1975	12.2	12.8	9.2	8.2
1979	11.7	13.4	10.2	8.3

[1] Khimiya v sel' skom khozyaystve, No. 2, 1981. Another factor which has hurt feeding efficiency is the improper composition of feed.

[29] The announced goal for 1985 is 18.2 million tons of meat.

[30] The annual average grain crop in the 1976–80 plan period was an increase of about 13 percent over the annual average crop in the 9th FYP; the annual average grain crop in the 1971–75 plan period was an increase of about 8 percent over the annual average crop in the 1966–70 plan period.

[31] Pravda Ukrainy, 18 March 1981. L. K. Ernst, of the All Union Academy of Agricultural Sciences imeni Lenin writes that in order to obtain the animal husbandry output planned for 1985, the minimum production of feed must reach 493.3 million tons (in feed unit equivalent). Vestnik sel'skokhozyaystvennoy nauki, No. 8, 1981, p. 86. The record high feed use came to 409.6 million tons in feed unit equivalent in 1978.

[32] According to a decree of November, 1980.

annual and five-year plans, however, it seems doubtful that farm managers will have much confidence in plan stability. They probably will still hoard resources against various contingencies.

VII. THE INFLUENCE OF OTHER FACTORS

A broad range of other factors will work against a resurgence in private agricultural activity. These include demographic trends, rural housing policies, the narrowing gap between retail food supplies in urban and rural areas, the inadequate supply of machines and implements, the poor marketing and transport structures, the narrowing gap between urban and rural incomes, and apprehension about the longevity of leadership support for private agriculture.

THE DEMOGRAPHIC TREND

Between 1970 and 1982, the rural population declined by 8.5 million.[33] Moreover, with the proportion of elderly in the rural population increasing, fewer able-bodied people are available to perform the heavy manual labor involved in cultivating plots and raising livestock, basically labor-intensive activities. Even now, labor in the private agricultural sector is disproportionately female. In the kolkhoz community, women perform 71 percent of the private agricultural labor (46 percent by women of able-bodied age and 25 percent by women of pension age); men of able-bodied age provide 20 percent of the labor expenditure; the remainder is provided by invalids and adolescents of both sexes, and male pensioners.[34] The number of women in rural areas between 30 and 70 years of age, the group which provides most of the labor in private agriculture, fell from 26 million in 1970 to 23 million in 1979.[35]

A per-family comparison of livestock holdings in 1970 and 1979 demonstrates that the decline in private holdings of livestock is due not only to a falling rural population but also to reduced feasibility of and interest in raising livestock (Table 4).

TABLE 4.—USSR: LIVESTOCK PER 100 RURAL FAMILIES

	Head		Percent change
	1970	1979	
Cattle	101.2	96.8	−4.4
Cows	63.0	55.3	−12.1
Hogs	67.2	62.0	−7.7
Sheep	115.9	106.0	−9.3
Goats	17.7	18.8	+6.6

Sources: Derived from Table 1, and 1970 and 1979 census counts of rural families. Livestock figures as of 1 January.

With the exception of goats, the holdings per family fell over the period. The sharp decline in private holdings of cows is contributing to the current milk shortages, as families have turned to the trade network, adding considerable stress on supplies.[36] The declines are even more pronounced in the RSFSR, where again holdings per rural family of all types of livestock, save goats, declined. In times of stress, private holdings of cattle (especially cows) decline while goat herds increase. Goats are the "poor man's cow"; peasants will substitute goats for cows when feed is scarce.[37]

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[33] Due to movement to cities, and the transformation of some rural populated centers into urban settlements.

[34] Extrapolated from data in P. Ustimenko, and A. Yakovlev, Sotsial'nye voprosy razvitiya sela, Moscow, 1981, p. 45, and Voprosy ekonomiki, No. 5, 1981, p. 68.

[35] Literaturnaya gazeta, 12 March, 1980.

Other demographic trends in the rural areas will tend to diminish private farming. For example, a recent study of private farming in the black earth zone of the Russian republic found an inverse relationship between occupational ranking and private plot activity among rural inhabitants. The study found that the higher the skill level or job description of a man or wife, the less likely the family was to keep livestock.[38]

The share of specialists—those with higher or some specialized secondary education—in collective and state farms has been increasing steadily. From 1960 to 1977 the proportion of specialists among collective farm workers has quadrupled, and the proportion of specialists among state farm workers has tripled.[39] Underlying the increase of specialists in the countryside is the rising educational level of rural residents. In 1959, the proportion of rural residents with a higher or at least some middle level education was one-fourth, rising to one-third in 1970 and to one-half in 1979.[40] As rural educational levels advance, interest wanes in performing the manual labor characteristic of private agriculture.

The study also found a strong correlation between the extended rural family and livestock raising. Eighty percent of extended families kept livestock, compared with 39 percent of single persons, 50 percent of married childless couples, and 51 percent of married couples with children. Here again, demographic factors seem to be working against private sector activity. In the 1979 census extended families comprised 17.5 percent of all families, compared with 22.9 percent in 1970.[41]

RURAL HOUSING POLICIES

The poor record of investment in rural services and housing as well as the attraction of higher wages and better services in the cities have caused a continuing migration from the countryside. But the government's push to increase and improve rural housing and services has also perversely affected private agriculture. This policy, now being publicly questioned, was intended to move the inhabitants of small and medium sized rural settlements to larger communities in order to provide goods and services more efficiently, and as part of a larger program to promote agricultural specialization. Many rural population points were designated as "non-viable"; new residential construction was banned. At the same time one or more demonstration communities per oblast were built, chiefly high-rise buildings with complete utility services—but without private plots, outbuildings for livestock, or cellars. According to a recent survey by the Belorussian Central Statistical Administration, families living in multistoried buildings have only one-third as many cattle and one-half as many hogs as those families living in detached buildings. Almost half of the rural families living in large apartment buildings keep no livestock at all. Furthermore, the practice of designating rural population points as "non-viable" is stimulating migration from rural areas; Soviet statistics show that two-thirds of the inhabitants of points so designated do not move to either model settlements or to "viable" rural settlements but to rayon centers, cities, and other oblasts.[42] A long-range plan calls for the liquidation by 1990 of 348,000 small villages, affecting 15.4 million persons.[43]

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[36] Milk shortages reflect the lack of an adequate marketing system. Although gross production of milk per capita is well above that of developed Western countries, only about 60 percent enters the marketing system.

[37] Six to eight goats can be kept on the feed required for one cow In addition, goats will graze on poor quality "scavenger feeds" because they can live on foods normally refused by other livestock.

[38] Literaturnaya gazeta, 12 March, 1980.

[39] Sotsiologicheskiye issledovaniya, No. 2, 1980.

[40] Vestnik statistiki, No. 6, 1980.

[41] Vestnik statistiki, Nos. 11 and 12, 1981, p. 60 and pp. 51-61; Itogi vsesoiuznoy perepisi naseleniya 1970 goda, Moscow, 1972-74, Vol. 7, pp. 238-248, 253.

INCREASING RURAL RETAIL TRADE IN FOOD

Over the last decade, the gap between urban and rural availability of food in state retail outlets has narrowed. The ratio of urban to rural retail food trade per capita was 2.6 in 1970, 2.4 in 1975, and 2.2 in 1980.[44] While the rural population has decreased, the number of state retail and cooperative stores in rural areas increased from 278.7 thousand in 1970 to 283 thousand in 1980.[45] In addition, many rural residents now journey to urban areas to purchase food.[46]

SHORTAGES OF MACHINES AND TOOLS SUITABLE FOR SMALL SCALE FARMING

With the continuing fall in the number of horses,[47] plowing isolated plots became more difficult. Although state and collective farms in some cases assist in plowing, individuals often must rely on their own hands and a few small implements. Despite years of planning, only recently has a mini-tractor suitable for small farming gone into production;[48] the production run is likely to be small, however.[49] The tractor is intended for sale to individuals, although most likely on what is called an "organized" basis. Prospective purchasers probably will first register and wait their turn, as with automobile purchases. Thus, the chances of the many million holders of private plots acquiring a mini-tractor in the near future are small. Because of the cost, such tractors may well be more feasible for "minicollectives," groups of 10–15 private farmers who work together, pooling their resources. Such groups are being encouraged on an experimental basis in Moldavia.[50]

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[42] Sovetskaya Rossiya, 7 December 1980, p. 2; Zemlya Sibirskaya, Dalnevostochnaya, No. 4, pp. 34-35.

[43] Voprosy ekonomiki, No. 5, 1978, p. 85.

[44] Derived from Narodnoye kozyaystvo, 1980, p. 428.

[45] Narodnoe khozyaystvo, 1980, p. 440.

[46] Many rural residents can also order food supplies at nearby state and collective farms. In Kalininskaya oblast in the RSFSR, for example, 58 percent of the families on collective farms and 75 percent of the families of state farm workers buy their milk at their farm. Officials in Omskaya oblast determined that up to 20 percent of gross meat production by state and collective farms was allocated to cover their own consumption needs. Sovetskaya Rossiya, 5 October 1981, p. 1; Sovetskaya Rossiya, 1 March 1981, p. 3.

[47] The number of horses in the USSR declined from 7.5 million in 1970 to 5.6 million in 1980.

[48] Izvestiya, 25 March, 1981; Sovetskaya torgovlya, 10 March 1981. The Belarus' MTZ-05 is a two-wheeled, five horsepower machine to which attachments for plowing, harrowing, cultivating and digging up crops can be coupled. It is equipped with four forward and two reverse gears. Without attachments the tractor will cost 1,100 rubles.

[49] Pravda, 8 December 1980.

A similar situation exists with regard to small-scale mowing machines for private plots.[51] Meanwhile, the leadership apparently has realized that the prospects for quickly mechanizing the private sector are not favorable and is turning to animal power as a partial solution. A June 1981 decree calling for the expansion of horse breeding was aimed at assisting farm work.

The outlook for a better supply of small agricultural implements is also problematical. Implements such as scythes are important; many tracts of land in private use were given to individuals because their terrain makes them unsuited to mechanized operations. In 1977 a number of governmental units involved in the production and sale of small implements agreed on a list of tools and equipment necessary for private farming. Only about half of the items on the list are now in production.[52] Because these items are generally assigned for production to factories of heavy industry and constitute only 1-2 percent of the factory's planned output, they receive low priority and are often produced only in small quantities. Voluminous complaints in the Soviet press indicate that the shortage of small implements is serious.

Numerous local Soviet officials have commented on the increasing reluctance of rural inhabitants to perform the manual labor of cultivating private plots or raising livestock. The campaign to mechanize the socialized sector has put more machinery on state and collective farms, but in the process—as one oblast secretary put it—"The gap between highly mechanized socialized production and the primitive methods of maintaining the private plot is being felt more and more keenly."[53]

MARKETING BARRIERS

Private producers must spend considerable time and effort to get their production to market, in part because of the lack of modern farm-to-market transportation. Soviet economists estimate that 200 million man-days a year are used in the independent marketing of private production. The network of points for the reception, storage, and processing of private production is thin. For example, the Chairman of the USSR Central Union of Consumers' Societies estimates that on average only one such point exists for 7,000 private plots. In the 11th Five-Year Plan, a high target has been set to improve the situation—the quadrupling of procurement points under the cooperative system. Given the problems affecting the construction sector, however, it is difficult to see how this plan can be met.

Marketing problems are caused in part by poor roads. Roads in rural areas are seriously underdeveloped, consisting mainly of seasonal dirt roads that connect farms with regional processing and distribution centers. The Soviet Union has only about 15 percent as much hard-surface roads as the US. Nevertheless, during 1981–85, over 80,000 kilometers of hard surface roads are to be built, about one-third less than in 1976–80.

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[50] Sovetskaya Moldaviya, 10 March 1981, p. 2.

[51] Pravda, 12 August 1981, p. 3.

[52] Pravda, 18 February 1981.

[53] Sovetskaya Rossiya, 5 October 1980, p. 2.

NARROWING RURAL-URBAN INCOME GAP

Before the mid-1960s private agricultural production was the main source of income and subsistence for many collective farm members. After a system of time and piece rates for collective farm members was introduced in 1966, fluctuations in income were reduced.[54] This, together with the effect of increased procurement prices, has cut the average income differential between all wage and salary workers and collective farm members[55] from 63 percent in 1970 to 43 percent in 1981. As a result, the earnings for private agricultural production have become a secondary rather than a primary source of income, although they still account for roughly one-fourth of total collective farm family income. In addition, the increasing monetization of collective farm income is reducing payment-in-kind, meaning that collective farm members have less access to grain and other feedstuffs with which to support livestock. Also, because the state farm average wage is much closer to the national average wage, subsidary income is not as important to state farm workers as to collective farm members. The average income differential between state farm workers and all other wage and salary workers has decreased as well, from 23 percent in 1970 to 14 percent in 1980. The ongoing conversion of collective farms into state farms will make subsidiary income even less important to an increasing number of agricultural workers.[56]

SUSPICIONS REGARDING OFFICIAL POLICY TOWARD PRIVATE AGRICULTURE

Since the beginning of the Brezhnev years the leadership has launched four campaigns to boost the private sector in agriculture—in 1964-5, 1969, 1972, and 1976–1977. Although the present campaign is receiving much attention in the Soviet press, the other campaigns quickly ran out of steam. Residual uncertainty about the longevity of leadership support may therefore deter the individual risk-taking needed to boost output.

Indeed, the uncertainty is well founded. In some party quarters a long-standing fear remains that the private plot system, if encouraged, will weaken work incentives on state and collective farms. For example, Party First Secretary Scherbitskiy of the Ukraine, an important agricultural region, did not publicly endorse the decree until almost a year after it was issued, and then only in lukewarm terms.[57]

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[54] Also until 1965 collective farm members were not included in the state retirement pension system; rather, they had to depend upon their private plots, stay active members of the collective farm, or depend upon what the collective farm might provide. The inclusion of the collective farms in the state pension system has reduced the dependency of retired collective farmers, although benefits provided them are lower than for state employees; in 1980 minimum pensions for collective farmers were raised to 40 rubles a month, and to 50 rubles a month for state employees.

[55] For socialized activity. Includes income-in-kind.

[56] In 1970, there were 16.7 million collective farm workers versus 8.9 million state farm workers. In 1980, there were 13.3 million collective farm workers versus 11.6 million state farm workers. Thus more rural residents have a higher income because they are on state farms.

[57] At the Ukrainian CPCC plenum November 25, 1981. Pravda Ukrainy, 26 Nov., 1981.

Even a recent article supporting the campaign warned that private plot activity can "have an adverse effect on the formation of the Soviet person's psychology, develop a moneygrabbing attitude, and engender speculation." Some Soviet commentators fear the fostering of the private agricultural sector may lead to a loosening of controls on private economic activity in general, and to "recurrences of bourgeois and petitbourgeois exclusiveness." [58]

VIII. THE HUNGARIAN MODEL

There are some indications, however, that the campaign to encourage private agriculture may not be short-lived.[59] For example, a Soviet agricultural specialist, writing recently in the prestigious journal Voprosy ekonomiki, spoke of the "socialist nature" of the private plot system. Widespread Soviet press interest in the Hungarian agricultural system—including a complimentary remark by Brezhnev at the recent 26th Party Congress—suggest that some elements of the leadership are searching for ways to further encourage private agriculture.[60]

Present Hungarian party and government policy is much more liberal toward the private sector than is Soviet policy. In the late 1960s, as part of its new economic mechanism (NEM), Hungary adopted a new ideological approach to private agriculture. The formula now used stresses the "organized unity" of the collective sector and the private household plots of the members of the collective farms, meaning that private farming is considered an "integral partner" with the socialist sector in agricultural production. This approach has been incorporated in the Law on Cooperatives. As a result, the production of the household plots of collective farms (and more recently the production from plots belonging to non-agricultural workers) now appears in the national statistics—unlike in the Soviet Union—as part of the socialized agricultural sector. Because of this expanded definition of the socialist agricultural sector, there is no restriction on the size of private livestock holdings.[61] On the contrary, the government encourages private herds by subsidizing the purchase of animals. Contractual agreements between private producers and the socialized farms are widespread, with the farms supplying young animals and feed and the private producers raising and fattening the animals.

Hungarian state and collective farms are expected to take account in their own economic plans of the needs of private producers by giving them technical advice, selling them seed, feed and animals, and providing transport and marketing services. This kind of inter-sectoral cooperation—which has further possibilities [62]—is a significant part of the Hungarian agricultural system. But while the Soviet leaders would like to emulate this aspect of the Hungarian agricultural system, they clearly are not ready to institute the changes that make Hungarian inter-sectoral cooperation successful and that would do much to aid private agriculture in the USSR. In Hungary, direct planning and control of socialized agricultural establishments by state bodies were abolished in 1968. Present economic and agricultural policy is market and profit-oriented. In agriculture as well as in the other sectors, the state confines itself to indirect controls (procurement prices, credits, subsidies). Within this framework, the managers of socialized farms have considerably more freedom to decide on and execute production plans than do their Soviet counterparts. They decide what to plant and how much livestock to raise, what implements to buy, when to market their production, and how to use farm profits.

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[58] V. Mazur, Kommunist, No. 5, pp. 71–82.

[59] In April 1981 an All-Union Conference on Private Plot Development—organized by the All-Union Academy of Agricultural Sciences, the USSR Academy of Sciences Institute of Economics, and the USSR Academy of Sciences Institute of Economics of the World Socialist System—was held in Moscow. The government is now also publishing a new "how-to" magazine, Priusadebnoye khozyaystvo, for private producers.

[60] In October 1981, a conference was held in Tbilisi on utilizing the Hungarian experience to increase private livestock production; it was attended by the Hungarian Minister and Deputy Minister of Agriculture, and by representatives of the USSR Ministry of Agriculture. Zarya vostoka, 20 October 1981. Georgian party chief Shevardnadze has been a vocal proponent of applying Hungarian innovations in Soviet agriculture.

[61] In Hungary, more than 50 percent of all pigs, and 75–80 percent of all poultry is privately owned. To encourage private ownership and breeding of cattle in Hungary (now about 26 percent of cattle in Hungary are privately held) the state is providing annual subsidies for each animal owned, which increases substantially when a cow calves.

In its present drive to foster private agriculture the Soviet leadership has adopted some features of the Hungarian private agricultural system—for instance, the lifting of controls on livestock holdings of individuals operating within the contract system, the permission to count contract animals toward state and collective farm delivery targets, and grants to purchase cattle. But private agriculture in the USSR must operate within a highly planned, centralized agricultural framework; the micro-level flexibility necessary to promote private agricultural production is possible in Hungary but not in the Soviet Union. Private farmers will continue to be the residual claimants of feed, fertilizer, and farm equipment.

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[62] For example, a division of labor between large socialized units concentrating on cattle, sheep and hog breeding, and the private sector concentrating on fattening animals provided by the public sector.

THE FOOD PROGRAM: A NEW POLICY OR MORE RHETORIC?

By Anton F. Malish*

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SUMMARY

On May 24, 1982, the Central Committee of the Communist Party of the Soviet Union (CPSU) approved a "Food Program" to be in place until 1990. The decision marks the official beginning of a "new phase" in Soviet agricultural policy formally unveiled at a Party plenum in October 1980. The thrust of this new program is to create in the USSR an integrated agro-industrial complex to coordinate the planning, financing and management of the agricultural sector, those industries serving it, and the downstream production and marketing facilities. In short, it views the solution to the continuing problem of adequately feeding the Soviet citizenry as a vertical one, extending from "farm to store." According to General Secretary Brezhnev, providing a reliable supply of foodstuffs is not only "top economic priority, but also an urgent sociopolitical task."

According to the Soviets, the food problem, characterized by a runaway demand for meat and dairy products, a shortage of fruits and vegetables, and chronic disruptions of retail trade in some regions, can be traced to at least four basic developments. First, the increase in Soviet money income while food prices remained stable resulted in greater comsumption demands than the system could handle. Second, the outflow of agricultural workers to urban areas exceeded productivity gains and reduced the resource base. Third, the remaining rural inhabitants tended to increase purchases of food in the state trade network rather than relying on their own production. Lastly, the general inefficiencies in the agro-industrial complex, particularly the waste and losses occuring in the procurement, storage, transportation, processing and trade of agricultural products, prevented distribution of what was produced to the dinner table. The Food Program proposes to attack all four areas.

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On the production side, mechanization of Soviet agriculture remains at an insufficient level, and existing machines are of low quality and poorly utilized. The situation for mineral fertilizers and herbicides is similar. State and collective farms are frequently hopelessly in debt because procurement prices for many commodities do not cover production costs. Solution to these problems are also to be found in the Food Program.

The long-term nature of the Program, however, must not be particularly comforting to the Soviet citizen. Although only in the second year of the Eleventh 5-Year Plan (1981–85), targets for the results of these new efforts are set in the latter half of the 1980's and 1990. And these targets are modest. For example, even if the program succeeds, per capita consumption of meat and meat products, milk and milk products, eggs, and fruits and berries (the high quality foodstuffs whose short supply currently causes much discontent) will still be below the recommended consumption norms set by the Institute of Nutrition. Nevertheless, the Soviets hope to reduce their imports of foodstuffs from capitalist countries.

While expanding cold storage facilities and elevators, building more and better agricultural machines, constructing warehouses for mineral fertilizers, and increasing mixed feed plants and silage facilities are necessarily long-term, the Soviets hope to see results "already this year." To achieve this they will rely on private plot production, better management, and price reforms that are to be quickly put in place.

Touted as a radical solution, the "Food Program" seems more a slowly evolving process that differs little from themes identified at Brezhnev's first plenum (1965) on agriculture. In highlighting the problems however, the Soviet leadership would seem to be inviting massive dissatisfaction if the program fails to show results.

INTRODUCTION

In five recent Communist Party Plenums (July 1978, November 1979, October 1980, November 1981, and of course, May 1982) General Secretary Brezhnev discussed, in unusual detail, the low level of the Soviet Union's food supply and the need for more efficient planning. The solution of these problems has come to be known as the "Food Program."

In many respects, this new policy dates back to at least the 1978 plenum on agriculture, and some conclude that, even then, it represents only changes in packaging from the course set at the March 1965 plenum which marked the debut of Brezhenv's agricultural policy. In any event, the failure of the Soviet state to provide a diet for its citizens commensurate with their aspirations, is a shortcomming of such significance that it can no longer be officially ignored.

The elements of what has come to be known as the Food Program are already well identified in Brezhnev's speech at the 1978 plenum. At the time, however, the urgency of the message was obscured by the record achievements in agricultural production obtained that year. The resulting satisfaction carried forward into 1979 although by then, Soviet agriculture had started a serious slide backward. Thus, in the context of a generally optimistic 1979 speech, Brezhnev found it sufficient to say: "* * * we have the right to, we must demand the more rational use of funds and equipment, so that the strengthening of the material and technical base in the villages may have a more tangible effect on supplying the country with foodstuffs."

In contrast, a more worried Brezhnev stated at the October 1980 plenum: "* * * we still encounter difficulties in supplying the cities and industrial centers with such foodstuffs as milk and meat," and a year later, few would disagree with his prediction that "* * * the problem of food is, on the economic and political level, the central problem of the whole [1981–85] 5-Year Plan."

Despite the escalating recognition of the seriousness of the situation, the Soviets do not appear willing to increase capital investment in agriculture at the expense of other sectors. Rather, the "distinguishing feature" of the 1980's agrarian policy is to rest on increasing returns from existing investment, increasing productivity, and otherwise improving agricultural efficiency. These elements, the essence of the Food Program, are now the centerpiece of Soviet agricultural policy. And yet, this "new" direction in agricultural policy is in fact a further elaboration of years-old plans to create an integrated "agro-industrial complex," which, in turn, seems to be an effort to transplant some of the best perceived experience of U.S. agro-business and vertical integration into the Soviet system.

SOVIET AGRICULTURAL PERFORMANCE

According to the 1981 plan fulfillment report, gross agricultural output in the USSR that year was valued at 120 billion rubles. Although key components of the output were not reported, most notably grain production, total output at that value would be 2 percent below 1980, and 12 percent below planned targets. Nineteen eighty one would mark the third consecutive year of declining agricultural output in the USSR. Output, as measured in ruble value, declined 3 percent in 1979 from the 1978 record, and in 1980, by another 2 percent. At 120 billion rubles, the value of agricultural production was 6 percent below 1978, and at the lowest level since 1976.

It is interesting to consider the impact of these three years of poor performance on particular crops. As already noted, the Soviets omitted reporting grain production in tallying national plan fulfillment. Moreover, they suppressed the grain production data in the reports of the major grain-growing republics. This failure to report the central constituent of Soviet agricultural performance is an unusual development confirming a poor crop. USDA's end-of-season forecast of the USSR's grain crop was 175 million tons, and since then, unofficial Soviet sources put actual output as much as 15 million tons below that. Such dismal production would compare to a 1980 output of 189 million tons and to 179 million in 1979. Since annual plan targets have been around 235 million tons for the past three years, it means the Soviets have suffered a 3-year cumulative plan shortfall of at least 155 million tons, or nearly the equivalent of a full year's crop. If the crop were as poor as 160 million tons, it would mean that in terms of today's demand for grain, the Soviets suffered a crop failure approximately equivalent of the 1975 disaster.

Non-grain crops did as poorly. Production of sunflowerseed, the major Soviet oilseed, reached only 4.65 million tons, about the same as 1980, and 28 percent below plan. In the last three years, sunflowerseed has been among the poorest performing crops in the USSR. Three-year cumulative plan shortfalls amount to 140 percent of a full year's crop, and production since 1979 has averaged a million tons less per year than achieved in the early 1970's.

Sugar beet production, at 60.6 million tons, was nearly a quarter below the already poor 1980 crop, and the smallest production since 1963. Three-year cumulative plan shortfalls exceed a full year's crop, and like sunflowerseed, production has averaged less than in the early 1970's.

Potato output, at 72 million tons, was up 7 percent from 1980, but still 17 percent short of plan. It was the second poorest crop in almost two decades, and only the previous year's crop was worst. Again, the Soviets are nearly a full crop short in only three years.

Soviet vegetable production has remained for 3 years at levels just above 25 million tons. Production in 1981, at 25.6 million tons, was 9 percent short of plan.

For the fourth year in a row, meat output fell short of annual goals. In 1981, meat production (slaughterweight) reached 15.2 million tons up only 1.3 percent from the 15 million ton output in 1980, but 5 percent short of plan, and 2 percent below the record achieved in 1978. Per capita meat consumption was being maintained (at only the 1975 level) by record meat imports of nearly a million tons.

Milk production has been in a 4-year decline despite increasing cow inventories. In 1981, production amounted to 88.5 million tons, 7 percent below plan. Indeed, one would have to go back to 1973 to find as bad a year for dairy production. The Soviets, in the face of tight feed and forage situations have maintained inventories, but at the expense of productivity.

The only bright spots in Soviet agriculture seem to be cotton and egg production. In 1981, cotton production stood at 9.6 million tons (seed basis), 3 percent above plan and just short of previous year's record crop. Egg production, at 71 billion eggs, was 5 percent above 1980, and 2 percent above plan. Apparently, the poultry sector received preferential access to feed supplies in both 1980 and 1981.

This brief survey of Soviet agriculture focused only on production shortfalls. One of the real problems in the USSR, however, is the waste and losses between the farm and the consumers. These losses are so great that the Soviets, although among the largest producers of agricultural commodities in the world, still cannot adequately feed their production.

THE FOOD SITUATION IN THE USSR

In terms of average caloric intake per person per day, the Soviet Union, at 3,200 to 3,500 (depending upon various Soviet sources), is among the best fed countries in the world. But in terms of the quality or variety of Soviet diets, or even the balance in terms of the main nutrients, the Soviets compare poorly with the United States or even with their counterparts in Eastern Europe. These deficiencies were exacerbated following three years of poor harvests, complicated by other factors including the U.S. partial embargo.

Meat supplies were generally good in Moscow as 1980 started. Pork, beef, and poultry were readily available in collective farm markets, and supplies in state stores were also adequate. Reports of generally adequate supplies coincided with Soviet published data for the socialized sector that showed heavier-than-normal slaughter of livestock, primarily hogs, in the first months of 1980.

Outside of Moscow, however, reports of dwindling meat supplies began to surface. By May, the only source of fresh meat in certain cities outside of Moscow were in central farm markets at prices considerably higher than in state stores. In some state stores, only sausage and canned meat were available. By summer, these reports were widespread, and supplies seemed particularly acute in the provincial and industrial cities of the RSFSR, the Far North and the Far East. While Westerners could not tell whether the conditions in those areas were significantly tighter than normal, many Soviets seemed willing to believe that the shortages were, in fact, worse than they had been in recent years. By June, shortages of meat and dairy products had reportedly triggered worker discontent and work stoppages in motor vehicle plants outside of Moscow.[1] Since in the USSR (as in most countries), auto workers are among the best compensated, for them to be involved in food-related work disruptions would suggest that severe food shortages must have been involved.

And conditions apparently deteriorated further. In February 1981, a Harper's article by George Feifer, reported that even in Moscow, milk supplies could no longer be assured, that sausage, cheese and specialty items "disappeared"; and that the butterfat content of milk was reduced. Feifer characterized the situation as "much worse than in 1971 and worse than I'd expected from reading the Western press."

Moscow correspondents for Western newspapers carried numerous reports of 1981's worsening food situation.[2] These stories generally concentrated on the long lines at meat and dairy outlets, the poor quality of food supplies that were on sale, the particularly short supplies of milk and butter, the high cost of fruits and vegetables in collective farm markets, and the number of shoppers from out-of-town who shopped in Moscow. Shoppers reportedly waited 4 to 6 hours in line for meat, and even in Moscow and Leningrad, chickens in farm markets were reportedly selling for about the equivalent of $3.30 per pound.

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[1] See the Journal of Commerce, June 16, 1980, the Financial Times, (London), June 13 and 23, 1980; and The Washington Post, June 14, 1980.

[2] See, for example, The Washington Star, February 8, 1981; The Washington Post, September 3, 1981; Le Monde (Paris), December 4, 1981; and The New York Times, January 15, 1982.

Reports by Western correspondents might concentrate on the more spectacular difficulties. But the Soviet press was carrying similar stories. In October, the USSR Minister of the Meat and Dairy Industry reported: [3]

> The demand for certain kinds of produce, especially meat, is not being fully satisfied. There are justified complaints from the consumers regarding the quality of products. The packaging of many products does not meet the demands of the consumers. Workers in the food industry are aware of these difficulties and shortcomings and will make every effort to meet more fully the demand of the Soviet people for high-quality foodstuffs.

An official confirmation of rationing of livestock products appeared in a speech by E. Schevardnadze, First Secretary of the Communist Party of the Republic of Georgia. Schevardnadze (Zarya Vostoka November 26, 1981) noted that rationing in urban areas would cause difficulties for rural dwellers "who can no longer buy up large quantities of butter and meat in city stores as they used to do." Schevardnadze called for Party and State officials to crack down on hoarding and speculation in livestock products. Two days prior to the publication of his speech, the Georgian daily, Kommunist, reported butter shortages in the Republic and the arrest of a number of people for speculating in butter.

District officials interviewed on Lvov (Ukraine) television [4] discussed the food supply in the oblast (i.e., district) and the "number of letters" complaining about meat and butter supplies. The panel discussion emphasized that children's and health organizations and public catering enterprises (i.e., canteens for workers and students) were to receive supplies of livestock products on a priority basis. The panel also chastised those who bought unnecessarily large quantities of bread and sugar, using the former to feed animals and the latter to produce home-made alcohol. While noting that "allocations of some types of foodstuffs are even higher than last year," a panel member stated: "the population's requirements (for food) are not being met in full, especially such items as meat, salami, and butter. At the same time, allocations of flour, groats, margarine, sugar, candy, canned vegetables, fish and a number of other foods this year remain at the 1980 level. . . ."

Soviet media also devoted unusual attention to bread conservation. As the harvest approached, Pravda (July 16, 1981), editorialized on the "careless attitude" toward bread, citing extravagance and waste in bread consumption, the need to produce smaller loaves to reduce leftovers, and the need to halt production of substandard baked goods. The article also noted that ". . . fodder concentrates intended for sale to members of the public [who keep livestock] frequently [go instead] to kolkhozes and sovkhozes. This practice leads to bread being used to feed livestock on personal plots. Strict supervision must be established here."

Similar articles appeared in Radyanska Ukraina (Kiev) on August 13, 1981, and again in Pravda on October 19. The second Pravda article noted that more than 5 percent of all bread baked ends "in the trash can"—an amount, according to the article, sufficient to feed two Republics such as Belorussia and Armenia, plus two Russian cities.

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[3] FBIS, Daily Report; Soviet Union, October 20, 1981.

[4] FBIS, Daily Report; Soviet Union, December 8, 1981.

Soviet campaigns to conserve bread are not new, and Soviet grain production even in bad years is enough to meet food demand. It is possible, however, that an extremely small crop put pressure on milling quality grains, and given the Soviets' interest in maintaining retail price stability for basic foodstuffs, the short crop probably put unusual demands on bread supplies. During 1981, vegetables (periodically), high quality margarine, confectionary, pasteries, nonalcoholic drinks, mayonnaise, and mineral water were other products whose supply was reported as inadequate.

WHY SOVIET AGRICULTURE DOES SO POORLY

Unfavorable weather conditions seem to be the primary reason for the string of production shortfalls. Fall-sown grains suffered heavy winterkill in 1979, and drought and the hot, dry winds, called *sukhoveys,* reduced yields in the European USSR. In 1980, excessive rain, cold weather, hurt crop development and complicated both spring sowing and autumn's harvest. In 1981, another cold, wet spring gave way to extensive drought over much of the Soviet grain area. Grain crops were stressed and developed with smaller and lighter heads.

Besides weather, a number of other factors, some institutional and some natural, hamper progress. Sunflowerseed production, for example, has been in a long-term decline because of lack of hybrid varieties, inadequate chemical inputs, chronic diseases, and poor farming technology. Soviet procurement prices may also discourage sunflowerseed production. Harvested sugar beets have been left to freeze in the fields, and once picked-up—often by being bulldozed into piles and then scooped-up with tractor-mounted shovels—contain so much foreign matter that processing plants break down.

During 1976–79, the USSR encountered serious difficulties with its fertilizer industry. The severe winter of 1978–79 adversely impacted production, but shortages of raw material and low quality production facilities were also involved. Mineral fertilizer production is now planned to reach 150–155 million tons in 1985, as compared to an original 1980 goal of 143 million tons, and actual production of 104 million tons. Soviet fertilizer handling techniques are primitive; fertilizer delivered to rail sidings has been known to sit uncovered until it coagulates into a concrete-like mass, and application techniques are nearly as wasteful.

Agricultural machinery is another chronic problem. In preparing for the May plenum, a commission of scientists analyzed the operating conditions on state and collective farms and reported an acute lack of farm machinery. According to the conclusions of the commission, Soviet agriculture had no more that 65 percent of the required combines, 65 percent of beet harvesters, and 43 percent of commercial fertilizer spreaders. The ratio of drawn equipment (i.e., ploughs or sowing implements) to tractors was put at 1.4 to 1 as compared to a required minimum of 3 to 1.[5]

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[5] FBIS, Daily Report; Soviet Union, May 18, 1982.

Party officials themselves frequently criticize Soviet agricultural machinery's low technical standards. The Soviet press so often reports shortages of key spare parts—tractor crankshafts, truck radiators, fan belts, gaskets, etc.—not to mention deficiencies in delivery of motor gasoline and diesel fuel, that is difficult to determine when the situation is worse than usual.

A general lack of pesticides and herbicides cause losses to weeds, rodents and insects. The 1980 grain crop was heavily weed infested, for example, but Soviet civil enterprises seem to lack the capability to produce high technology plant protection agents.

In addition, certain overlying national developments seem to hurt agriculture more than proportionally. Soviet agricultural research, probably done as well as in our own universities and laboratories, is but slowly and tediously transmitted to the farm. Productivity suffers, in part because incentive is lacking when rising money incomes cannot be translated into desirable goods. And there are not enough hands to go around. According to an account by a Soviet journalist (TASS, February 13, 1981), the Soviet Union is currently short workers for about 2 million jobs, and the new mills, mines, and factories in Siberia and the Far East will require an additional 800,000 to 1 million workers annually.

The labor shortage may be worse in agriculture where (in addition to demographic factors) a strong outward migration exists. Military training, higher wages in construction work, military or civil enterprises that can obtain permission for workers to move to towns, the nature of farm work itself (in the USSR about a third of the cotton, for instance, is still picked by hand), the lure of city life in general, all provide encouragement for younger folk to leave the countryside. That the agricultural labor force decline over 10 percent between 1960 and 1978 is not attributable to increased machanization or productivity alone, and those who remain behind are usually older and less productive.

Lastly, the Soviets face really serious setbacks in delivering what is produced to the dinner table. Reception centers and elevators are often some distance from the farms. Cold storage facilities are inadequate. Container transport, especially for agricultural freight, is poorly developed, and the lack of liaison between various ministries means that a multitude of signatures and approvals are needed; and yet, crosshauls, the unnecessary passage of commodities through various warehouses and depots, all lead to product losses and delines in quality. A Soviet professor of economics cataloged some of the problems in Pravda (September 2, 1981):

> * * * there is a low level of freezing equipment and storage capacity. Storage for fruits and vegetables doesn't have ventilation and refrigeration . . . One-third of the food products was packaged in 1978 in the USSR. The situation is no better now * * *
>
> It is typical, in Soviet agriculture, that there are annual significant losses of potatoes, sugar beets, and cabbage that are left in the soil because of transportation shortages. The same is also true for tomatoes * * *.
>
> The packing situation is no better. In some years the fields, especially in the southern Ukraine, are literally aflame with ripe tomatoes. But some of them are simply left in the plantations—there is nothing to carry them in, despite the fact that stores have few tomatoes to offer or none at all. The production of crates is still carried out on an unplanned basis * * *.
>
> The paradox is that an increase in yields engenders more significant losses of agricultural goods * * *.

The same commission mentioned earlier reported that direct losses amount to 20 percent of grain production, 20 percent of fruits and vegetables, one fourth of sugar beets, and one third of potatoes.[6] Indeed, the high losses suffered by Soviet agricultural means that the USSR has to be among the largest producers of most agricultural products just to provide an adequate supply. In 1980, for example, the Soviets, who did not have a good year, were the world's largest producer of rye, oats, barley, wheat, sunflowerseeds, sugar beets, potatoes, cotton, milk, and mutton and lamb. When production is adversely affected, shortages develop, despite the sheer magnatude of production, because of the problems involved in distribution. And in good years, losses and waste are simply higher.

DIRECTIONS IN SOVIET AGRICULTURAL POLICIES

None of the problems above would come as a shock or a surprise to Soviet officials. Some of the shortcomings are many years old, and were addressed in the March 1965 plenum on agriculture, which set forth the basic principles of agrarian policy, and which still apply. That plenum, for example, was especially critical of a procurement price system that failed to cover the cost of production. It also stressed the problems caused by administrative interference in the management of state and collective farms, the insufficient investment in agriculture, a neglect of agricultural technology, and various other management mistakes. Under the Brezhnev-Kosygin administration, procurement prices were quickly raised, procurement quotas fixed for 6 years into the future, and, perhaps most significantly, a capital investment in the national economy was redirected toward agriculture.

In the Eighth 5-Year Plan (1966–70), capital investment in agriculture increased by 69 percent over that in the previous plan period, to 81.5 billion rubles. In the Ninth 5-Year Plan (1971–75), an additional increase of 60 percent occurred and investment reached 130.5 billion rubles. These investments were large, not only in absolute amounts, but increased agriculture's share of total investment in the national economy from 20 percent in 1961–65 to 26 percent in 1971–75.

Such a massive redirection of priorities could not have failed to achieve some results, and, despite widespread drought in 1975, Soviet agricultural production was impressive, especially for the livestock products singled out for their special contribution to the overall standard of living.

USSR AGRICULTURAL OUTPUT OF SELECTED COMMODITIES ANNUAL AVERAGES, SEVENTH, EIGHTH, AND NINTH 5-YEAR PLAN PERIODS

[In million metric tons, unless otherwise noted]

Commodity	1961–65	1966–70	1971–75
Grain	130.3	167.6	181.6
Vegetables	16.9	19.5	23.0
Sugarbeets	59.2	81.1	76.0

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[6] Ibid.

USSR AGRICULTURAL OUTPUT OF SELECTED COMMODITIES ANNUAL AVERAGES, SEVENTH, EIGHTH, AND NINTH 5-YEAR PLAN PERIODS—Continued

[In million metric tons, unless otherwise noted]

Commodity	1961–65	1966–70	1971–75
Sunflowerseeds	5.1	6.4	6.0
Meat	9.3	11.6	14.0
Milk	64.7	80.6	87.4
Eggs (billion eggs)	28.7	35.8	51.4
Gross agricultural output (billion rubles)	82.8	100.4	113.7

Source: The USSR in Figures for 1980, pp. 108–109.

Brezhnev reflected on these improvements, and on the billions of rubles devoted to agriculture, in the 1978 plenum, saying:

> Everything possible has been done to intensify agricultural production. In the first place, we have changed the approach to investments in agriculture. We treat this matter as the connerstone for the further development of agricultural production and we have made it a rule to systematically increase these investment as much as possible.

Even before the 1978 address, however, it was clear that the massive rate of investment in agriculture could not be sustained. In the Tenth 5-Year Plan (1976–80) the rate of agricultural investment growth dropped by half, to 30 percent, and while the rubles continued to increase, to 170.7 billion, agriculture's share leveled off at 27 percent, where it will remain through at least 1985.[7]

While increasing capital investment in agriculture was still cited as the Party's "fundamental policy" at the 1978 plenum, by then Brezhnev could only promise that agriculture's share in the development of the national economy "should not be lower than the one achieved [in the Tenth 5-Year Plan]."

Thus, by 1978, a new theme, that of increasing efficiency, improving coordination, integrating management activities, and reducing losses and waste, was rapidly coming to the fore. In fact, the elements of a new policy, one that two years later would be called the "Food Program," were already identified when Brezhnev said:

> The experience of the past years shows that the capacity of the industies servicing the countryside must be increased at a faster pace. So, the new 5-Year Plan should make adequate allocations for the development of agricultural machine-building, the production of fertilizer and plant protection agents, the processing industry and all other industries related to the agro-industrial complex.
>
> It is quite natural that the growth of public welfare in recent times has brought about an increased demand precisely for livestock products. This has given rise to a situation where, in spite of a noticeable increase in the production of meat, milk and other products and improvement in the organization of work in the sector the present level of development of livestock farming does not meet the swiftly-growing requirements . . .
>
> It is a no less important task to see to it that every kilogram of finished products reaches the consumer.

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[7] Interestingly, studies suggest that the growth in Soviet agricultural output, at least the bulk of that which occurred between 1970–77, came as a result of these additional inputs, not so much from increased productivity on the farms. See, for example, Douglas Diamond and W. Lee Davis, "Comparative Growth in Output and Productivity in U.S. and USSR Agriculture," Soviet Economy in a Time of Change, JEC Committee Print, 96th Congress, 1st session, 1979.

THE FOOD PROGRAM

At the October 1980 plenum, Brezhnev reemphasized agriculture's role in raising Soviet living standards. He stated:

> The Political Bureau of the Party Central Committee recently adopted a decision to prepare for a food program. What is meant is a program whose aim is to combine all matters in the development of agriculture and the branches of industry, procurement, storing, transportation, and processing which serve it, including matters in the development of the food industry and retail trade of food products * * *

Following the October plenum, the "Food Program" was cited as a "radical solution" to the deepening food problem at the 26th Party Congress, and since then the Soviet press has carried a barrage of editorials, interviews, and reports on its implementation.

During 1981, research institutes and agencies throughout the USSR were engaged in shaping the program. Because of its scope, the major implementing decisions surely numbered in the tens of thousands, and, as in any re-organization, individual and agency fortunes were at stake at every turn. But even allowing for the inertia that characterize the response of big bureaucracies to new ways of problem-solving, the pace of implementation seemed to be slower than expected. While many observers anticipated an elaboration of the program at the November 1981 plenum, Brezhnev simply stated that it would be discussed "at one of the next" Central Committee plenums. That plenum was not held until May 24, 1982, and operational details are still just now coming to light.

Even without official specification, certain aspects of the "Food Program" have been identified. These elements can be classed as long-term, requiring considerable capital investment (expanding the rural road network, for example), whose impact is years away. The investment targets in the Eleventh 5-Year Plan do not suggest that these changes will be made soon. In the Twelfth Plan period (1986–90) investment in the entire agro-industrial complex is to amount to one-third of the entire volume of capital investment in the national economy, but this share is no larger than that already specified in the current period.

On the other hand, the groundwork for certain institutional changes have already been set and they can be implemented more quickly. The bulk of such reforms are directed at improving efficiency in the production and marketing of farm products and begin at the lowest organizational level.

USSR FOOD PROGRAM GOALS

[In million metric tons]

Commodity	Actual output		Plans	
	1971–75	1976–80	1981–85	1986–90
Grain	181.6	205.0	238–243	250–255
Sugarbeets	76.0	88.7	100–103	102–103
Potatoes	89.8	82.6	87–89	90–92
Sunflower seeds	6.0	5.3	6.7	7.2–7.5
Soybeans	([1])	.5	1.4	2.2–2.3
Meat	14.0	14.8	17–17.5	20–20.5
Milk	87.4	92.7	97–99	104–106

[1] Not available.

INCREASED INCENTIVES FOR PRIVATE PLOT OUTPUT

General Secretary Brezhnev's May 24 statement emphasized the private plot and the subsidiary holdings of enterprises as a quick way to increase production of meat, milk, poultry, potatoes, vegetables and fruit, and fish. But this is hardly a new development.

In January 1981, the Central Committee of the Communist Party and the USSR Council of Ministers issued a decree entitled "Additional Measures to Increase Agricultural Production by Subsidiary Private Plots." This decree was important because it continued and accelerated programs begun cautiously after Khrushchev's departure, and which gained momentum following a 1977 decree that also encouraged subsidiary private plots. The new decree is significant because it clearly linked the private plot with efforts to increase livestock product output.

In 1979, private plots of collective farm members totalled 3.86 million hectares, while other lands at personal use (the private subsidiary plots of state farm workers, for example) numbered 3.70 million hectares. Combined, these plots comprised only 1.4 percent of all Soviet farming lands (sown land, fallow, orchards, vineyards, pastures, etc.) but they produced 30 percent of the meat, milk and eggs, 60 percent of the potatoes, and over 50 percent of the fruits and berries.

Clearly, increasing incentives to private-plot holders represented an attempt to expand output of those high-quality food products that the socialized sector has been unable to supply in adequate amounts, and to better integrate private-plot output into the planning process.

The new decree established no limitations on the number of livestock belonging to collective farmers, workers, employees and other people, provided that the animals are raised under contract with collective farms or state farms and cooperatives. The fattened livestock, poultry, and also milk produced on private plots would be purchased by collective and state farms and cooperatives for sale to the State procurement organizations. The products sold to the State can be counted against the farm's plan fulfillment goals. They may also be included in calculations for over-plan bonus payments for quantity and quality.

The contract commits the state and collective farms to provide subsidiary private farms with young animals and poultry, fodder, grazing and meadow rights, marketing services, and sets the terms of payment. Livestock on private plots without contracts are still limited by legal quotas but may be used in accordance with the owner's wishes.

Under the decree, the Gosbank (State bank) is obligated to grant state and collective farms the short-term credit needed to settle accounts when contract animals and produce are delivered. In addition, USSR Gosbank will provide workers and employees who are members of horticultural cooperatives with credits up to 3,000 rubles for acquisition or construction of garden cottages and improvement of garden plots. Under the 1977 decree, such credits were limited to 1000 rubles to be be repaid in 5 years. The new credits can be repaid in 10 years, beginning after a 3-year grace period.

The 1981 decree permits not only workers and employees, but doctors, teachers, and pensioners on state farms to buy cows and heifers. It provides for allowances to state farms and organizations to enable them to sell their animals at half price. By the new decree, young families can obtain free of charge young livestock and help in building farm facilities if a family member is a worker on a state farm or similar organization. Collective farms have been urged to participate in the program.

The 1981 decree includes many other incentives. Appropriate ministries, organizations, and collective and state farms are to provide: (1) greater access to pasture and hay-cutting lands in state forests; (2) plots for fodder production on idle land; (3) credits for acquisition of agricultural equipment; (4) allowances to build cooperative cowsheds; (5) help in transportation and procurement of agricultural production; (6) construction materials, fertilizers, etc.; and (7) agronomical and veterinary services.

The new decree is in keeping with the concerns about continued shortfalls in meeting the demand for meat and milk. By encompassing both production and marketing, it is consistent with the new concepts of agro-industrial planning. Its main purpose, however, seems to be in mobilizing additional reserves to overcome significant shortages of rural labor. The decree seems covertly designed to make rural life more financially rewarding, to induce residual workers or pensioners back into active production, and to encourage urban dwellers and industrial workers to take a second job in the agricultural sector.

On the basis of one year's experience, it is hard to judge how effective the decree has been. The feed situation was extremely tight throughout 1981 and into 1982. With a grain crop of 160 million tons Soviet feed usage amounted to about 112 million tons of grain during the 1981-82 July-June marketing year. Usually, the private sector is the first to feel the effects of a tight feed and forage sector. In failing to publish grain production in 1981, the Soviets also omitted a customary breakout of animals in the private sector. These animals, which on January 1, 1981, comprised nearly a fifth of all livestock in the USSR may have been substantially reduced rather than expanded as implementation of the decree would suggest.

With better agricultural weather in 1982, Soviet encouragement of private plot production could begin to show results. The practice of fattening livestock under agreement between plot holders and state and collective farms is reported to be spreading. The monitoring service of the BBC (January 15, 1982) quoted Radio Riga as saying that "practically all" state and collective farms in Latvia had entered into such agreements. Official encouragement continues, with the Soviet stressing the significant production potential of the private sector. Ideological objections are being countered by articles such as one appearing in the September 7, 1981 issue of Ekonomicheskaya Gazeta, which stated that the plots must "be viewed as a component of the country's unified food complex." The article also argued that it was necessary to create the proper social climate "in which the kolkhoz members, workers and employees and other citizens feel that in raising livestock and poultry on their private plots and engaging in vegetable and fruit growing they are undertaking useful state business." The contract arrangements, the article went on to say, "guarantees that private farms retain their socialist nature and prevents the possible development of private ownership tendencies."

Other writers have questioned how much of an incentive the private plot decree really gives. Karl-Eugen Wadekin, in the Spring 1982 issue of Foreign Affairs, calls the policy "25 years too late" primarily because the younger generation is leaving the countryside, and because of the possibly that selling private produce to the public sector will not reap rewards similar to sales in the central farm markets. The Food Program at least partially takes these issues into account by calling for additional housing construction (farmsteads "complete with ancillary structures for personal subsidiary holdings" according to Moscow's Domestic Service's repeat of Brezhnev's report), roads, schools, and cultural and service establishments in the countryside to reduce distinctions in social conditions between urban and rural areas.

Whether the private sector remains a "significant reserve" over the long run is an open question. The problem of incentive would seem to remain as long as the array of available consumer goods is insufficient, and the tendency for migration to urban areas likely represents fundamental changes in Soviet lifestyle not easily countered by the opportunity to invest more of one's free time in animal husbandry.

GREATER INITIATIVE AT THE FARM LEVEL

In July 1979, the Central Committee and the Council of Ministers decreed that, while Gosplan (State Planning Committee) was responsible for establishing control figures for basic economic indicators and norms, local production facilities and farms were responsible for providing counter plans for increasing production efficiency and finding additional material and production reserves. At the October 1980 plenum, Brezhnev addressed the relationship between central planning and local initiative. While he again underscored the overriding role of central planning of the national economy, he noted:

> On the other hand, it is necessary to develop in every way the initiative from localities, or working collectives and managers for normal functioning of the economy. Most current issues should be decided precisely at the places where they can be decided quickly, without undue delay and consultation.

Following the October speech, Z. N. Nuriyev, Deputy Chairman of the Council of Ministers, gave some indications of the direction this statement provided for agriculture. According to Nuriyev, "excessive tutelage" over farm managers should be eliminated. State and collective farms should be given "a strictly limited number of indicators" dealing primarily with inputs. Instead of a large number of plan targets, a single plan for product procurements by the State should be sufficient. Other indicators of performance, including the output volume of types of products, the structure of sowing, the livestock population and productivity, crop yields, forms of labor organization, questions of the social development of rural areas, and the like, should be worked out by the farm leaders and specialists themselves.

At the 26th Party Congress, Brezhnev cited the work of agricultural cooperatives and enterprises in Hungary and experiments with agro-industrial cooperation in Bulgaria as models for further study and wider use by the Communist Party of the Soviet Union. The reference to the Hungarian experience was considered especially significant since Hungarian farm managers have considerable control of the planning process. The gist of these statements suggest that the Food Program will almost certainly stress management efficiency and greater decentralization of production and marketing decisions.

Farm-level reforms.—Efforts to improve management efficiency will probably have to address work organization on the state and collective farms. Presently, tasks are assigned by function, plowing, seeding, harvesting, farm machinery repair, etc., with individuals primarily concerned with fulfilling their own quantitative indicators. Thus, individual farm workers see their tasks in light of the number of hectares plowed, the number of tomatoes picked, the number of repairs made, etc., without any particular worker sensing responsibility for the final harvest. According to I. Shikhov, writing in the October 21, 1981 issue of Literaturnaya Gazeta, these preceptions result in workers simply running up hectares on the tractor and "storming" to make up for time lost. They have little concern that missed seeding dates or other poorly-done tasks result in smaller harvests.

To refocus farmers' attention towards the final outcome, rather than the immediate task, Shikhov and other reformers point to the Hungarian model of "unregulated links." Under such a system, farmers would be assigned sections of land, allocated machinery and equipment, and left to organize production at will. They would still have to meet production goals, but they would retain a portion of any profits made. Making the assignment of land and machinery long-term would provide the incentive to safeguard assets.[8]

The Food Program would make the link between work done and final results more direct by broadening the practice of payments in kind. Grain workers would receive free of charge up to 15 percent of the grain raised above plan. Those who assist in the harvest would be issued grain towards their pay. State farm workers and those who assist in the production of potatoes, vegetables, fruit, berries, grapes, melons, and fodder crops would be permitted up to 15 percent of output, and an additional bonus, to vary by farm, of above-plan produce. Collective farms are urged to adopt the same payment scheme.

In order to free-up funds for productive investment, collective farms will be forgiven 9.7 billion rubles (about $13.5 billion at official exchange rates) in debts owned to the state bank and have an additional debt of 11 billion rubles (about $15.3 billion) deferred.

Reforms increasing the farmers' personal stake in the harvest or in upgrading the profit incentive for individuals and collectives would still fail to address an overriding national incentive problem—that money wages, which have already risen significantly, do not provide a higher standard of living. Food shortages, as noted, are already widespread, and Soviet consumers have a high propensity to spend increased income on a higher quality diet. Shortages of other consumer goods, their low quality, the lack of opportunity in rural areas to upgrade housing or attend cultural activities, all mean that additional income tends to be involuntarily saved. Soviet writers have increasingly pointed out the necessity of balancing wages and commodities (see, for example, Trud, August 14, 1981). In the West, economists see the savings "overhang" as so serious that it already mitigates productivity increases and labor mobility. One writer with considerable background in the Soviet economy sees the extra rubles as so distorting that "the rulers are practically forced to take these savings away (or at least 'freeze' them for a long time)." [9] Whether the Soviet leadership can defuse these excess savings without an outburst of discontent is an open question, and, under the circumstances, they diminish whatever incentive that profit motives or personal responsibility might otherwise provide.

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[8] For a more detailed explanation of these possible reforms see, for example, Radio Liberty Research, (RL 456/81), Andreas Tenson, "Personal Involvement: The Missing Element in Soviet Agriculture," November 13, 1981, and (RL48/82) Karl-Eugen Wadekin, "Prospects for Abasha Experiments," January 29, 1982.

Oblast-level reforms.—Above the farm, increased management efficiency will probably involve expansion of district-level agro-industrial complexes or so-called "interdepartmental coordinating councils." These would be organized at the rayon or oblast level, and even at the republic level. Already in operation on an experimental basis in Georgia and Latvia, the councils would regulate all economic activity in a given area. Composed of representatives of all the farms and enterprises in the area, the party organization, and the local administration, they would assume widespread managment functions for the agro-industrial complex in their area of responsibility. Beside on-farm production, the councils would oversee procurement, transportation, storage, processing and sales of agricultural products.

A reform of this sort, would be designed to overcome the bureaucratic barriers that currently compartmentalizes agricultural management. Under the present system, a collective farm seeing, for example, a local demand for poultry, would have to await a feed allocation since first priority for poultry feed is given to farms organized under "Ptitseprom," the Soviet poultry complex. Because dressing plants lack capacity, chickens rest in cages awaiting slaughter, and loose weight. But because payments to farms are based on slaughter weight, the farm's returns on the entire effort suffer. Similar problems occur in spare parts distribution, repairs, capital construction, and probably other spheres as well.

As 1981 ended, numerous articles calling for improving agricultural management appeared in the Soviet press. In Georgia, the first republic council began to function (Zarya Vostoka, February 24, 1982). The USSR Supreme Soviet Presidium approved the efforts to unify agricultural management in Georgia and Latvia (Pravda, March 11, 1982). Such organizations fit well with an expanded role for "economic levers" (such as profits).

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[9] Igor Birman, "The Economic Situation in the USSR," Russia, Number 2, 1981, p. 20.

GOVERNMENT AND PARTY REORGANIZATION

While the Food Program moves toward greater decentralization at the farm and at the oblast level, Soviet press articles were less clear as to how leadership of the Program will be organized at the top. Initially, the Soviets moved to create a new Ministry of Fruits and Vegetables, a new Ministry of Chemical Fertilizer, and merger of two Forestry Ministries into a Ministry of Timber, Pulp and Wood Processing. In addition, a new department for farm machinery was established in the Party Central Committee. These reconfigured organizations involved personnel changes, a desire to identify individual responsibilities, and efforts to concentrate administration and improve coordination.

After these first efforts, a major bureaucratic debate apparently developed over how to proceed, and, even on the eve of the long-awaited plenum, its outcome could not be clearly predicted. Some writers favored the creation of a new Soviet State Committee (or super ministry) to organize and then administer the Food Program.[10] Others supported vesting control in Gosplan (the State Planning Commission) or in the Ministry of Agriculture. Still others would put the major emphasis at the interdepartmental coordinating councils.

Brezhnev's Food Program address speaks of creating agro-industrial commissions or councils at all governmental levels and at the "center," but at the same time, says the management apparatus will be made simpler, cheaper, and stripped of its "redundant elements." Similarly, while the commissions are to be a "full-fledged and democratic management body" the responsibility of government bodies (ministries?) and party organization "is growing."

On June 12, 1982, the USSR Council of Ministers announced the formation of the national-level counterpart of the oblast and republic commissions. The 15-man body, headed by the Deputy Chairman of the Council, and composed of the highest-ranking members of the ministries and industries engaged in the production, planning, and marketing of food, was to carry out the decisions adopted at the May plenum. Whether the individual ministries actually lost any authority to the commission is as yet unclear.

A MORE RATIONAL PRICE SYSTEM

A keystone of the Food Program involves a series of price reforms. Such reforms ushered in the Brezhnev era, and it is interesting that they have played an important role a second time.

During 1981, the Soviets revised purchase prices for key agricultural commodities. The bonus payments formerly paid for above-plan sales became an integral part of the state procurement price. Farms were to be paid 26 percent more for corn, 25 to 26 percent more for peas, 50 percent more for fodder vetch and 33 percent more for millet and rye. Other procurement price increases were put into effect for soybeans, cotton, and milk. Certain republics increased prices for livestock, potatoes, sugarbeets, and some vegetables. With the new basic prices in effect, a 50-percent bonus is to be paid to farms and other agricultural enterprises whose sales exceed the average annual level achieved in the Tenth 5-Year Plan. According to Ekonomicheskaya Gazeta, April 20, 1981, the 50-percent bonus for output in excess of previous sales (instead of in excess of the procurement plan) is directed at eliminating payments to farms which do not increase production, but nevertheless meet their (too low) targets.

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[10] An important voice, P. Alekseyev, editor-in-chief of Izvestiya is one of the supporters of the super ministry concept. Writing in Kommunist, Number 2, January 1982, he favored the creation of a USSR Ministry of Food Supply, with the "necessary rights" to "provide effective management of this most important national economic sector."

According to the May 24th address, many state and collective farms are operating at a loss. Thus, on January 1, 1983, procurement prices are being raised for cattle, pigs, sheep, milk, grain, sugar beets, potatoes, vegetables and some other products. Bonus prices are contemplated for low-profit farms. These measures are again aimed at stimulating production and minimizing losses, but, as noted before, the overriding problem of national incentive when money income does not lead to a higher standard of living remain.

Accordingly, it should not be assumed that the Soviets will forever maintain retail prices for staples, especially for meat. Although the Soviets take great pride in the fact that the retail prices for bread and baked and pasta products, the main types of fish and canned goods have not been changed since 1955, and that the retail price for meat and milk products remain at the 1962 level, the option for price increases (despite the reaffirmation of stability at the 26th Party Congress) has not been entirely closed. In discussing retail price increases on alcoholic drinks and tobacco and some other consumer goods implemented on September 15, 1981, the Chairman of the State Committee for Prices of the USSR, while pledging stability of staples prices, reported: "The production conditions, increased spending on obtaining raw materials, and the securing of the rational use of resources and of some commodities determine the objective need to make some correction into prices."[11] And a professor of economics saw the problem in light of the ruble "overhang." According to A. Komin; "it would be wrong to believe with the rapid growth of the population's money incomes that prices for all consumer goods could be kept frozen for decades."[12] While he too emphasized the maintenance of retail prices for the main food and nonfood goods, he said; "But ensuring this stability is a broad problem on many levels. It does not merely amount to keeping price levels unchanged but demands, at the same time, the expansion of production . . . . This requires supplementary capital investments." It is perhaps significant that the Food Program makes no mention of maintaining current food prices.

If the Soviets continue to increase procurement prices, while maintaining retail prices in state stores, larger and larger budget expenditures will be required for retail price subsidies. In 1980, these subsidies (at official exchange rates) were already estimated at $46 billion. The distortions they generate, feeding bread to livestock, long lines and periodic outages, would only seem to worsen.

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[11] "The Reason for Changing Prices," Moscow News, Number 38, October 4, 1981.

[12] A. Komin, "Talk on a Topical Theme: 'Retail Price Policy,' " Sotsialisticheskaya Industriya, September 16, 1981.

Thus, some observers attribute the campaign to conserve bread as necessary propaganda before increasing the price of that commodity. Increased meat prices would likely be a part of any retail price reform. While the Soviets may remember that Solidarity got its start over just such an issue, other East European countries have recently been able to raise meat prices without the public outcry that traditionally accompanies such decisions.

CONCLUSION

The Food Program seems to be the cheapest way of satisfying consumer desires in the USSR without undertaking major re-directions of investment capital. While the directions of the Food Program listed here seem appropriate first steps, there is little reason to believe that the USSR's food problems will be solved within a short period of time. The targets for the 1981-85 plan would seem hopelessly compromised on the basis of 1981's performance alone. But once embarked on the solution of what is widely perceived as the single most serious flaw in the Soviet system, the leadership would surely invite massive dissatisfaction if it failed to show results. Under the circumstances, the Food Program (or something like it under a different rubric) is likely to remain the centerpiece of the Twelfth 5-Year Plan and perhaps later ones as well.

U.S.-USSR GRAIN TRADE

By Angel O. Byrne, James E. Cole, Thomas Bickerton, and

Anton F. Malish*

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INTRODUCTION AND SUMMARY

Few internationally traded commodities, possibly only petroleum, capture the attention of policymakers, commodity traders and the man-on-the-street with the intensity of grain exports to the Soviet Union. And few reactions have been as volatile. The "mutually beneficial" agreement with the USSR in July 1972, which the Secretary of Agriculture called a major achievement in international relations and trade [1] became, a short time later, "The Great Grain Robbery." More recently, the U.S. partial embargo, intended to "force the Soviet Union to pay a heavy price for the aggression . . . in Afghanistan" [2] became a "body blow" that was "bad for our farmers, bad for our economy, but not that bad for the aggressors we were supposedly going to punish." [3]

Obviously, U.S.-USSR trade—the bulk of which consists of a flow of grain to the Soviet Union—generates high emotions and expectations of considerable leverage in influencing Soviet international behavior. One half of this story, the examination of the decision-making process in using food as an instrument of foreign policy, is addressed in a companion paper in this compendium. The other half, an examination of the development of this trade, the expectation for further development (assuming the absence of further political disruption) and the mechanics of the actual transactions are explored here.

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[1] USDA, "Foreign Agriculture," July 17, 1972, p. 2.

[2] Announcement by the Vice President, January 7, 1980.

[3] Remarks by the President to Agriculture Editors and Representatives, March 22, 1982.

During the fifties and sixties, the Soviets were usually grain exporters. Large imports corresponded to particularly poor harvests. Grain imports which had been running about 1 million tons annually, jumped to 10.4 million tons following the disappointing 1963 harvest. In the 1970's, Soviet record grain imports also related to poor harvests, as in 1972, 1975, and 1979. But large grain imports became common-place. The long-term goal of increasing per capita meat consumption raised Soviet demand for feed grain considerably. After 1975, the Soviets realized that their meat consumption goals could not be met if they allowed poor grain harvests to result in distress slaughter of animal herds. Thus, the Soviets relied increasingly on the world grain market, and particularly the United States for feed grains.

The U.S. sales suspension apparently caught Soviet planners by surprise. They adopted, however, purchasing additional grain from U.S. competitors, reducing feed use, and drawing down their grain stocks. Later, they moved to protect these new sources of supply by signing various long-term supply agreements with Argentina, Canada, and Brazil. Because the United States, even in taking an action designed to damage the Soviet feed-livestock economy, held to the international commitment (not to interfere with exports of 6–8 million tons of wheat and corn each year) included in its long-term agreement with the USSR, it still ranked second among major suppliers of grain to the USSR while the embargo was in effect.

U.S.-USSR trade began to recover after April 24, 1981, when the partial embargo was lifted. Although the possibility of future disruption cannot be dismissed, stated U.S. policy—that farm exports will not be selectively embargoed, and that a general embargo would be a response only in extreme situations when national security is threatened—and the embargo protection provisions of the Agriculture and Food Act of 1981, would seem to significantly minimize that risk. Renewed Soviet domestic commitments, to make the agriculture sector more efficient as set out in their "Food Program," and the need to rebuild stocks following years of significant harvest shortfalls, suggest that the Soviets, unless foreign exchange problems become acute, will remain major importers of grain through at least the mid-1980's. The United States can be expected to have a significant share of that market.

U.S.-USSR AGRICULTURAL TRADE REVIEWED

U.S.-USSR agricultural trade in the late 1950's and early 1960's was small, a situation which reflected Cold War tensions and Soviet economic policy geared toward self-sufficiency. The Soviets tended to be net grain exporters, averaging 6 million tons per year (figure 1). From 1955 through 1963, for example, U.S. agricultural exports to the USSR were substantially less than $100 million per year, and fractions of a percent of total U.S. agricultural exports. In 1964, however, following a 23-percent decline in Soviet grain output a year earlier, U.S. agricultural exports to the USSR rose sharply to $129 million and accounted for 2 percent of total U.S. agricultural exports. But trade declined immediately afterward, and at the 1965 Communist Party plenum which established the Brezhnev-era of agricultural policy, the emphasis remained on developing stockbreeding based on Soviet domestic grain production.

THE SOVIET GRAIN PURCHASES OF 1972

Nineteen seventy-two was a disastrous year for Soviet agriculture. In the face of massive crop failures, Soviet policy makers decided to re-enter the world market and purchase grain from the United States. The Russians began negotiations to purchase grain from the United States as early as April 1972, knowing at that time that considerably increased winterkill of wheat and a definite lack of moisture compromised crop prospects. A team from the United States headed by the Secretary of Agriculture went to Moscow to discuss credit terms, but no agreement was reached because the Soviets sought longer terms and lower interest rates than the 3-year terms USDA then offered through the Commodity Credit Corporation (CCC). In June 1972, negotiations were renewed and an agreement concluded. The Soviets agreed to purchase not less than $750 million of U.S. grain over a 3-year period. The U.S. Government provided the Soviets a 3-year credit from the CCC of $550 million at terms consistent with those provided regular customers.

At the time, the agreement was widely hailed. U.S. wheat stocks were at levels equal to three times annual U.S. consumption and farm prices were depressed. The agreement was seen as a way of increasing farmers income, improving U.S. balance-of-payments, and creating jobs. Because world wheat prices were lower than the level of farm prices being maintained in the United States, subsidies were paid in accordance with USDA regulations then in effect to compensate export firms for the price differential.

As the 1972 drought worsened in the USSR, the Soviets negotiated for large purchases of about 12 million tons of wheat, 6 million tons of feed grains, and 1 million tons of soybeans from the United States. That year the United States sold about 25 percent of its wheat crop to the USSR. In the end, however, the 1972 grain sales came under strong criticism. Numerous groups complained that subsidies were not necessary to bring about the sales, that the sales had an adverse inflationary impact in the United States, and that the rapid depletion of U.S. grain reserves left the United States unable to respond to the needs of less developed countries.

As a result of these criticisms, new legislation was enacted by the United States. The Agriculture and Consumer Protection Act of 1973 required exporters to notify the U.S. Department of Agriculture of large contracts and large export sales. The Jackson-Vanik amendment to the Trade Act of 1974 prohibited CCC credits to non-market economies with restrictive emigration policies. And, amendments to the Export Administration Act clarified the President's authority to institute export controls to safeguard against serious inflationary impact of foreign demand such as could result from a Soviet grain crop failure.

In 1973, U.S. exports to the USSR exceeded $1 billion, some $900 million of which was wheat and course grains (tables 1, 2, and 3).

THE U.S.-USSR GRAIN SUPPLY AGREEMENT

In the fall of 1974, when the United States was expecting a short corn crop, the President intervened to prevent sales of 3.4 million tons of grain to the USSR. Concerned that a second "robbery" had been narrowly averted, the Senate's Permanent Subcommittee on Investigations held hearings on Soviet grain sales. Testifing before that Subcommittee, Secretary of Agriculture Butz stated:

> I think the alternative [to some form of export controls] is to enter into some kind of long-term contractual arrangement which the United States does in fact do with some countries and some other countries do so that we know specifically what the minimum take-off will be every year and can plan for it.[4]

In the summer of 1975, as a result of drought in the major grain areas of the USSR, the Soviets once more reentered the world grain market in a substantial way. On September 9, 1975, the United States sent a negotiating team to Moscow to arrange for a long-term grain agreement. The agreement was designed to moderate the highly erratic nature of Soviet purchases and the disruptions such as those associated with the 1972 sales. On October 20, 1975, the White House announced that the United States concluded a 5-year grain agreement with the USSR.[5]

In general, the Soviet Union agreed to purchase at least 6 million metric tons of wheat and corn in approximately equal proportions for each of 5 years beginning October 1, 1976. The Soviets agreed not to purchase more than 8 million tons in any year without the prior consent of the U.S. Government. These quantities could be reduced only if the United States suffered a crop failure and grain stocks fell below a specified amount. The Soviets also agreed to spread their purchases and shipments as evenly as possible over each 12-month period. All purchases were to be made from private commercial sources and in accordance with normal commercial terms. Wheat and corn were the only commodities covered by the agreement.

The Soviet herd expansion undertaken in the second half of the seventies presented a ready-made market for U.S. grain. Between January 1, 1976 and January 1, 1980, for example, Soviet cattle numbers increased by 3.5 percent, hogs by 28 percent (recovering from distress slaughtering in 1975), and poultry by a third.

Historically, the USSR stressed production of food grains, principally wheat and rye. Livestock expansion, however, raised the demand for feed grains, and unlike farmers in the United States, the Soviets use large amounts of wheat and barley in animal rations. Compared to corn, however, these grains are lower in energy content. Similarly, soybean meal is a more effective source of protein than cottonseed or sunflower meal which is more common in the Soviet Union. Neither crop is particularly suited to Soviet climatic conditions, and so the desire to expand herds and improve feeding efficiency inevitably drew the Soviets to the United States, the world's largest producer and exporter of both corn and soybeans.

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[4] Sales of Grain to the Soviet Union, Hearing before the Permanent Subcommittee on Investigations, Committee on Government Operations, 93rd Cong., Second Session, October 8, 1974, p. 56.

[5] White House Fact Sheet, "Grain and Oil Trade Agreements With the USSR," October 20, 1975.

The Soviets made their first major purchase of corn in 1972, and by the late 1970's, the United States was supplying about four-fifths of Soviet corn imports. Wheat imports, primarily milling quality, freed lower-quality Soviet wheat for animal feeding. Even for wheat, however, the United States had significantly increased its market share until these trends were disrupted by the partial embargo of January, 1980.

USSR IMPORTS OF CORN AND WHEAT, TOTAL AND U.S. SHARE, 1976–81

[Million metric tons]

Year	Total corn imports	U.S. share		Total wheat imports	U.S. share	
		Quantity	Percent		Quantity	Percent
1976	11.4	8.8	77	6.7	1.7	25
1977	4.0	3.6	90	6.3	3.0	44
1978	13.2	9.9	75	8.9	2.9	33
1979	14.5	12.0	83	9.6	5.4	56
1980	10.0	4.2	42	14.9	1.8	12
1981	16.3	5.4	33	17.8	4.1	23

Note.—Total USSR corn and wheat imports since 1977 are Economic Research Service, USDA, estimates; official Soviet sources report value data only. U.S. data are based on official U.S. export statistics.

The value of U.S. grain exports to the USSR soared reaching a record $2.3 billion in 1979. Of this total, wheat exports accounted for $850 million and corn $1.5 billion.

THE U.S. PARTIAL EMBARGO

In January 1980, in response to the Soviet invasion of Afghanistan, the U.S. Government imposed a partial embargo on sales of agricultural products to the USSR. The embargo was directed at the Soviet feed-livestock economy, and prohibited grain sales to the USSR over and above the 8 million tons of corn and wheat committed under the U.S.-USSR Grain Supply Agreement.

Data suggest the Soviets intended to import about 38 million tons of grain in the 1979/80 July-June marketing year, 27.5 million of which would have come from the United States. The action denied the Soviets about 12 million tons, forcing them to secure additional supplies from other exporters, pay higher prices, reduce feed use in the latter half of the marketing year, and draw down stocks. They probably made up about half of the denied U.S. grain.

U.S. efforts to prevent Soviet purchases from other sources were only partially successful. USDA reported that Australia, Canada, and the European Community undertook specific commitments to restrain sales to the USSR in order not to replace shipments denied by the United States. Argentina did not agree to restrain sales but cooperated in monitoring trade flows. In addition, USDA asked major grain exporters in the United States to refrain from selling third country grain to the USSR.[6] Support for coordinated efforts, however, quickly erroded.

On June 20, 1980, U.S. grain companies were told that trade consistent with third country policies would be compatible with the general U.S. policy of restraining sales to the USSR. For the new marketing year, Australia and the EC agreed to limit 1980–81 sales to the previous year's level, but Canada agreed to limit sales to "normal and traditional" amounts. During the latter part of 1980, the Soviets found alternative sources for essentially all the grain denied by the United States. Cooperation with Canada and Australia may have been further weakened by a U.S. grain supply agreement with China signed on October 21, 1980.

Following the imposition of the U.S. embargo, the Soviets moved to secure other supply sources, and signed long-term supply agreements with Argentina (July 1980), Canada (May, 1981), and Brazil (July, 1981). While the value of U.S. grain exports to the USSR fell by more than 50 percent (from $2.4 billion in 1979 to $1.1 billion in 1980), the value of grain imports from U.S. competitors rose dramatically (figures 2 and 3). U.S. wheat exports to the USSR dropped in 1980 by about 60 percent, but exports from Canada and Argentina almost tripled in volume. Of the total 10 million tons of corn imported by the Soviets in 1980, the United States supplied more than half under the agreement. Exports from Argentina more than doubled in volume, however, and exports from Canada rose over tenfold. Despite the cutback in U.S. grain exports to the USSR in 1980, the United States ranked second among major suppliers of grain to the USSR even when the embargo was in effect.

THE POST-EMBARGO PERIOD

U.S.-USSR trade began to recover following the April 24, 1981 lifting of the U.S. partial embargo. With its termination, U.S. exports of agricultural commodities destined for the USSR reverted to the general licensing procedures in effect before the imposed embargo. However, under the terms of the U.S.-USSR Grain Agreement, additional sales of wheat and corn could not be immediately resumed because the Soviets had already purchased the full 8 million tons after which consultations between governments were required. Such consultations were held June 8–9, 1981, and the United States made available to the Soviets an additional 3 million tons each of wheat and corn. On August 5, 1981, U.S. and USSR negotiators concluded a 1-year extension of the agreement, which was scheduled to expire September 30, 1981. In consultations held in Moscow during September 30 and October 1, 1981, the United States offered an additional 15 million tons of wheat and corn over the 8-million-ton level committed in the sixth year of the Agreement. The Soviets resumed U.S. grain purchases in August 1981. During the fifth year of the agreement (October 1, 1980 to September 30, 1981), they purchased 9.4 million tons. By the end of September 1982, they had purchased 13.9 million tons (6.1 million wheat, 7.8 million corn) for delivery in the extension year (October 1, 1981 to September 30, 1982) of the agreement.

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[6] A brief description of the cooperation with other exporting nations can be found in two USDA publications, Impact of Agricultural Trade Restrictions on the Soviet Union, FAER No. 158, April, 1980, and its Update, FAER No. 160, July, 1980.

On December 29, 1981, new U.S. economic sanctions were imposed against the Soviets because of their "heavy and direct responsibility for the repression in Poland." None of these sanctions had a direct impact on current U.S.-USSR grain trade arrangements, although postponement of negotiations on a new long-term grain agreement could have some future implications. While the United States made it clear that it would not selectively embargo agricultural commodities, considerable uncertainty existed over the possibility of a total trade embargo against the Soviets to be taken in unspecified circumstances as an additional sanction. However, in March 1982, the President reaffirmed that farm exports would not be used as an instrument of foreign policy except in extreme situations when national security is threatened, and then, only in the context of a broader embargo when the cooperation of other nations could be obtained.

USSR GRAIN TRADE OUTLOOK

As of November 1982, the Soviets had not revealed the size of their 1981 grain crop. This omission gave strong credence to the belief that the grain harvest was a very poor one—probably the worst since 1975. USDA's estimate is 160 million metric tons. Crop size, obviously, is a key element in determining grain consumption levels in the USSR, and in forecasting future trade flows. Thus, the failure to report the 1981 crop makes trade projections even more tenuous than they would otherwise be.

THE 1981-82 GRAIN MARKETING YEAR

In terms of today's demand for grain in the Soviet Union, a 1981 grain crop as poor as 160 million tons would have represented nearly as severe a shortfall as the Soviets suffered in 1975. Such a small crop may have put unanticipated pressure on Soviet bread supplies. Since the winter wheat and winter rye areas were down 3.4 million hectares from the previous year, the Soviets may have experienced shortages of milling-quality grains. If so, it would explain the larger-than-expected imports of bread grains.

During the 1981/82 marketing year, grain imports moved into Soviet ports at a record pace. As the year ended, these imports were thought to amount to about 46 million tons, a quantity consistent with port handling capabilities. The Soviets, however, have shown remarkable ability to increase grain handling through its ports, and handling capability is not expected to be a major constraint on future imports.

Table 4 shows USDA estimates of Soviet grain supply/utilitization. Grain used for seed, industrial purposes, and food, have shown little year-to-year variation over time, and probably remained at 78 million tons in 1981/82, regardless of crop size. Grain-for-feed use, however, would be expected to show a significant reaction to a crop as small as 160 million tons. At that level, only about 112 million tons of grain could have been used for livestock feeding. This would represent a reduction of 12 percent from peak feeding in 1978/79, and an even larger drop in grain fed per animal unit. Numerous

Soviet press reports and editorials urging bread conservation during 1981, give support for believing that the feeding of bread to livestock—a phenomenon in the USSR brought about by constant retail bread prices despite periodic increases in procurement prices for grains—may have been larger than "normal."

Grain production of only 160 million tons, combined with a decrease in grain-for-feed and a lower estimate for dockage-waste [7] would result in a total utilization of only about 206 million tons, a decrease of 22 million tons from 1980/81. Thus, even with record imports the Soviets could not have met all their grain needs.

With the third consecutive poor grain harvest and with growing grain requirements to sustain herds and to rebuild depleted grain stocks, the Soviets purchased more U.S. grain than they would have liked. U.S. grain exports to the USSR in the July–June 1981/82 period are estimated at somewhat over 15 million tons, again making the United States the dominant supplier. Of this total, U.S. coarse grain exports to the USSR probably accounted for 8.5 million tons and wheat exports the bulk of the remainder. Next to the United States, the main grain suppliers were Argentina and Canada with totals estimated at close to 13 million metric tons and nearly 9 million metric tons, respectively.

1982–83 MARKETING YEAR

In early June 1982, USDA reduced its estimate of the Soviet 1982 grain crop below trends (based on 1976/80 average area) for 10, 15, 25-year periods. These trends would have given 1982 output of 198, 206, and 218 million tons, respectively. The lower June USDA estimate, 185 million tons, was based on very slow spring seeding, an expected smaller area, and unfavorable weather, particularly hot, dry, conditions, in the New Lands. A crop that low represents an unprecedented fourth consecutive year of poor harvests.

Grain imports in marketing year 1982/83 are expected to continue to be substantial and are currently projected at 34 million tons. Wheat imports, at an estimated 20 million tons, would permit the Soviets to meet domestic consumption goals. Coarse grain imports, estimated at 19 million tons, would maintain grain utilization primarily in livestock feeding. The United States would be expected to supply about 10 million tons of wheat and coarse grains, combined.

The level of Soviet grain imports (and the U.S. share) in the 1982/83 season will, however, depend on a number of unknowns. The size of the 1982 crop will be the major influencing factor. At semi-annual consultations under the Grain Agreement held in May, 1982, the Soviets indicated that with a reasonably good harvest (output along trend projections) wheat imports would likely remain at the 1981/82 level. Imports of feed grain, however, might be bolstered only because of the continued emphasis being placed on maintaining herd numbers.

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[7] Soviet data on grain production are in terms of "bunker-weight", i.e., grain as it comes from the combine. It therefore contains varying amounts of moisture and foreign matter, for which deductions called "dockage-waste" are made. These deductions are primarily influenced by rainfall at harvest, and in an average year the dockage-waste would probably amount to no more than 10 percent of production.

Other factors which would influence the level of Soviet grain imports in marketing year 1982/83 would include: the availability of grain from various suppliers; price relationships among grains; and the Soviets' ability and willingness to commit a large share of their foreign exchange earnings to grain imports. World grain supplies are expected to be large in 1982/83 and would set a favorable climate for continued heavy Soviet imports. Large grain crops are in prospect for the major grain exporting countries in the face of only a modest increase in world import demand. Thus, a number of countries could be faced with significant increases in year-ending stocks. Grain prices at export locations reflected this situation, with wheat and corn prices weak through the first 2 months of 1983.

Grain utilization for seed, industry, and food in the USSR for 1982/83 is projected to continue at 78 million tons. Large livestock inventories together with expected larger supplies of grain suggest a recovery in domestic use of grain-for-feed in 1982/83 to around 117 million tons. With improved feed utilization in 1982/83, there should begin a gradual recovery in the livestock sector. However, a full recovery in livestock productivity will require at least 2-3 years of good feed supplies.

The impact of the poor feed supply going into 1982 was evidenced in livestock performance in the socialized sector during the first 4 months of 1982. Slaughter cattle and hog average weights fell to the lowest levels in recent years; hog inventories which normally bear the brunt of short feed availabilities fell, and meat output (liveweight) declined. Furthermore, milk output continued on a downward trend that has been in evidence in the last 4 or so years—a direct result of a drop in cow productivity because of poor roughage availabilities and evidently such inherent problems as feeding inefficiencies. From all indications, the Soviets were maintaining livestock inventories at the expense of lighter-weight animals and lower productivity as evidenced in the continuing drop in milk yields per cow.

LONG-TERM PROJECTIONS

Prospects for achieving the USSR planned average goal of 238-243 million metric tons of grain during 1981-85 appear out of reach, especially following very poor performances in 1981 and 1982. In order to reach these goals, grain output in the next 3 years (1983-85) would have to reach 290 million tons annually—a totally unrealistic expectation. The Soviets apparently also realized that the Eleventh 5-Year Plan had been compromised, since the newly adopted "Food Program" shifted emphasis from 1985 to targets for 1986-90. After 1985, for example, the rate of increase in targeted grain production would be leveling off, with annual output in 1986-90 being 250-255 million tons, only 5 percent above the preceding plan's targets.

Production estimates.—Long-term trend projections, beginning in 1955 and using production of 160 million tons in 1981 and production as high as 185 million in 1982, generate estimates of future production averaging 211 million tons per year in the Eleventh 5-Year Plan period (1981-85). For 1986-90, the linear trend projects

227 million tons per year. Recently published research by Padma Desai using the same data (but ending in 1978) suggests that grain output can vary by nearly 50 million tons per year with a 60 percent confidence interval and adjusting for the asymmetrical impact of bad weather (i.e., bad weather takes a higher crop toll than good weather produces extra grain).[8] Knowing that actual production can, and probably will vary significantly, trends through 1990 are shown below:

USSR: TREND AND ESTIMATED GRAIN PRODUCTION

[In million metric tons]

Year	Trend	Season production estimate
1981	205	160
1982	208	185
1983	211	
1984	214	
1985	218	
1986	221	
1987	224	
1988	227	
1989	231	
1990	234	

Prediction of seasonal weather events over the decade is not possible, but Desai observed that on the average, three years can be expected to be "normal", one year will result in a below-average crop, and one year in an above-average crop within each 5-year period. The sequence, of course, is unknown, but the current rash of below-average crops (1979–82) would lead one to believe improvement in Soviet weather is likely between now and 1990.

Utilization estimates.—Soviet non-feed use of grain is expected to change little during the mid-1980's. Seed use varies by cropping patterns and winterkill, but the amount has been fairly stable, amounting to 26–29 million tons annually since 1972. Because the Soviets face higher risks of winterkill and poorer germination prospects, their seeding rates are higher than U.S. rates. Grain for industrial use is based on Soviet production of alcohol, beer, corn starch and syrup. Industrial use is slowly growing at a rate of about 100,000 tons per year. Dockage and waste, as noted earlier, is a function of production, and can be projected at about an average of 10 percent of production. Slowly declining per capita consumption of flour products has been offset by population growth to give a slowly rising food consumption figure. Thus, livestock feeding and Soviet desires to rebuild stocks will be the primary determinants of grain imports during the mid-1980's.

Statistically, a very strong correlation exists between grain fed one year and Soviet meat output the next. However, given Soviet meat goals set out in the Food Program, and the modest grain production trends envisaged here, past relationships suggest that the amount of grain for feed needed to meet those goals would be unrealistically high. Indeed, even before the U.S. sales suspension, Soviet thinking in regard to feeding vast amounts of grain, primarily wheat, to livestock was changing. Numerous articles appeared in the Soviet press bemoaning the "overconsumption" of grain and also urging correction of the protein deficiency in Soviet livestock rations. Soviet agricultural scientists have recognized for some time that wheat feeding is economically inexpedient and nutritionally inefficient. The use of wheat for livestock feed reportedly has contributed to a substantial protein deficit of in livestock rations.

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[8] Padma Desai, "Soviet Grain and Wheat Import Demands in 1981–85," American Journal of Agricultural Economics, May, 1982, p. 313.

Thus projection assumptions for the remainder of the 1980's are based on the following: (1) a decreasing proportion of wheat used as feed, (2) an increase in Soviet pulse production, (3) about trend production and yields of wheat and coarse grains, (4) massive imports of grains early in the 1980's first to preserve herds and then to rebuild stocks, (5) an improvement in feeding efficiency through institutional changes such as expansion of livestock production by the private sector and improvement in livestock rations, and (6) livestock product output considerably short of goals.

Based on these assumptions, Soviet grain imports through the five years, (1983/84–1987/88) should remain heavy and are projected to average about 31 million tons a year as shown below (the first two years show 1955–82 trend values along with the seasonal estimate in parentheses):

USSR: GRAIN SUPPLY AND UTILIZATION PROJECTIONS

[In million metric tons]

Year	Production	Trade		Supply	Total	Seed	Industry	Food	Dockage waste	Feed	Stock change
		Imports	Exports								
1981/82	205	43	1	247	223	27	4	47	20	125	+24
	(160)	(46)	(1)	(205)	(206)	(27)	(4)	(47)	(16)	(112)	(−1)
1982/83	208	38	1	245	226	28	4	47	21	126	+19
	[1] (180)	(34)	(1)	(213)	(213)	(27)	(4)	(47)	(18)	(117)	0
1983/84	211	35	1	245	231	28	4	48	21	130	+14
1984/85	214	32	1	245	235	28	4	48	21	134	+10
1985/86	218	31	2	247	244	29	5	49	22	139	+3
1986/87	221	30	2	249	248	29	5	49	22	143	+1
1987/88	224	29	2	251	250	29	5	49	22	145	+1

[1] November USDA estimate.

Clearly, Soviet stock rebuilding will be delayed, and will total a more modest level than if trend crops had been obtained in 1981 and 1982. As the Soviets try to increase the proportion of coarse grains in livestock feed, the use of wheat for feed will fall from a 37-percent share of all grain fed to a 35-percent share by the mid-80's. With a projected drop in wheat requirements, the USSR will probably try to meet its wheat import needs from "safe-source" countries other than the United States. It is possible however, that a renewed U.S.-USSR Grain Agreement will continue a requirement for Soviet minimum wheat purchases. The large import requirements, especially while stocks are replaced, suggest that the United States should realize a significant share of Soviet grain imports in at least the next two grain-marketing years.

The use of high-protein non-grain feeds, such as oilseed meals, should improve the protein balance in livestock rations. Soviet production of oilseeds has done very poorly. Therefore, there is little doubt that the Soviets will continue to offset their disappointing oilseed outturns by increasing imports, especially soybeans and soybean meal. It is projected that by the mid-1980's, the Soviets may be feeding as much as 9 million tons of oilmeal, compared to about 6 million tons fed at the end of the 1970's. Thus, Soviet imports of soybeans and meal are expected to remain high and be one of the fastest growing commodities. It is expected that the United States will figure prominently as a supplier even after the Soviets turn to other suppliers.

HARD CURRENCY CONSTRAINTS

Soviet hard currency difficulties are considered serious but not insurmountable. Increased levels of agricultural imports will require the Soviets to purchase relatively less of other goods as hard currency reserves are re-allocated. This situation is likely to continue until either Soviet agriculture returns a good grain harvest—at the earliest in 1983—or the Siberian natural gas pipeline starts earning hard currency—at the earliest in late 1984. The Soviets are expected to deal with their anticipated deficits with the non-socialist countries in the early 1980's by selling several hundred tons of gold and using other stocks of bullion as collateral to obtain loans.

The Soviets should have ample gold to sell throughout the 1980's. In recent years, the Soviets have mined more than 300 tons annually.[9] During 1977-79, the Soviets were able to average sales of more than 300 tons. During 1980 and 1981, sales dropped to an estimated 90 and 230 tons, respectively, even though Soviet grain imports were increasing.

Concern that the price of gold not fall below $300 per ounce in 1981 probably motivated the Soviets to reduce gold sales. Since mid-1981, the Soviets have requested short-term credits to finance transactions which would normally be settled in cash. In some cases, the Soviets have been deferring purchases of certain goods. In addition, the Soviets have begun to use gold as collateral. An estimated 200-300 tons of gold were used to obtain loans from European banks.[10]

The magnitude of the 1982 Soviet trade deficit with nonsocialist countries, particularly with the developed West, depended to a great deal on the amount of hard currency the USSR earned from energy exports, primarily natural gas and oil. Such earnings are particularly vulnerable to fluctuations in world energy export prices since these commodities account for more than 50 percent of Soviet sales to the nonsocialist countries. As the world price of oil declined in 1982, the Soviets had to increase the volume of these exports.

Since Soviet agricultural output in 1982 was expected to again be far below target levels, USSR agricultural imports are projected to have remained high. For example, by June 1982, Soviet soybean and sugar imports already had exceeded 1981 levels. Grain imports too were expected to be heavy again in 1982 but be below the level reached in 1981. Even though Soviet purchases of these agricultural commodities have remained high, the USSR succeeded in keeping the size of its 1982 trade deficit with the nonsocialist countries relatively small. As of June 30, 1982, the Soviet trade deficit with nonsocialist countries was less than $1 billion, in sharp contrast to the January–June 1981 period when the deficit soared to $3.9 billion. This recent improvement in the USSR trade balance has been achieved as a result of the Soviets restraining the growth of their imports from the industrialized West and developing countries. By January 1983, the Soviets were expected to completely erase their June 1982 trade deficit with the nonsocialist countries.

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[9] Michael Kaser, "Soviet Gold Production," Soviet Economy in a Time of Change, JEC Committee Print, 96th Congress, 1st Session, 1979, p. 296.

[10] Journal of Commerce, March 25, 1982.

Soviet hard currency debt remains small relative to Soviet hard currency exports earnings. As of June 30, 1982, the Soviet gross and net debt to Western commercial banks was $14.5 billion and $7.9 billion, respectively.[11]

The ability of the Soviets to anticipate the value of their hard currency earnings was made somewhat more difficult by the imposition of economic sanctions resulting from Moscow's support of martial law in Poland. European Community sanctions appeared rather limited in nature and were expected to reduce Soviet imports by less than a billion dollars. Stricter credit restrictions were also expected to be applied by the West. Additional U.S. sanctions, broadening the ban on the use of U.S. technology in both the Urengoi-Uzhgorod gas pipeline and the joint Russo-Japanese oil and gas development project, had been imposed to temporarily restrain Soviet hard currency earnings growth by delaying their construction. Soviet annual earnings from the Siberian gas pipeline reportedly could approach $8 billion. The U.S. decision to extend this economic sanction against the USSR, however, was rescinded 5 months later. U.S. allies failed to support the ban.

Faced with continuing hard currency problems, Soviet commodity-importing organizations can be expected to aggressively seek additional hard currency loans and credits. They will likely be especially price conscious and will try to channel as much trade as possible into barter arrangements. Imports of some goods may be disrupted as Soviet foreign trade organizations periodically exhaust their hard currency allocations. Western policies making credits harder to obtain would likely result in reduced imports of lower priority items. The most essential imports and high technology goods would likely continue to flow. In the short run, grain imports must remain at high levels in order for livestock herds to be maintained. But as pointed out elsewhere, Soviet crop prospects, rather than macro-analysis of hard currency flows, are probably of greatest importance in determining future grain imports.

APPENDIX A. STATISTICAL TABLES

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[11] Wharton Econometric Forecasting Associates, "Developments in CPE Debt to Western Commercial Banks During the Second Quarter of 1982," Centrally Planned Economies Current Analysis vol. II, No. 88, November 5, 1982.

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TABLE 1.—U.S. TRADE WITH THE USSR, 1950–81

[In million dollars]

Year	Exports to the USSR	Imports from the USSR
1950	0.6	40
1951	.1	32
1952	.02	17
1953	.02	11
1954	.2	12
1955	.2	17
1956	4	25
1957	—	17
1958	3	17
1959	7	27
1960	38	23
1961	43	23
1962	15	16
1963	20	20
1964	145	21
1965	44	43
1966	42	49
1967	60	41
1968	57	57
1969	105	47
1970	119	64
1971	161	46
1972	542	88
1973	1,191	204
1974	607	334
1975	1,834	243
1976	2,306	215
1977	1,621	221
1978	2,249	530
1979	3,604	873
1980	1,510	431
1981 [1]	2,430	357

[1] Preliminary.

Source: Foreign Agricultural Trade of the United States, Economic Research Service, USDA.

TABLE 2.—U.S. TRADE WITH THE USSR, 1972–81 [1]

[In million dollars]

Year	U.S. exports			U.S. imports		
	Total	Agricultural	Nonagricultural	Total	Agricultural	Nonagricultural
1972	542	430	112	88	4	84
1973	1,191	920	271	204	5	199
1974	607	300	308	334	9	326
1975	1,834	1,133	701	243	7	238
1976	2,306	1,487	819	215	8	206
1977	1,621	1,037	584	221	11	210
1978	2,249	1,687	563	530	12	517
1979	3,604	2,855	749	873	15	858
1980	1,510	1,047	463	431	10	421
1981 [2]	2,430	1,685	765	357	12	345

[1] No adjustments made for transhipments.
[2] Preliminary.

TABLE 3.—U.S. AGRICULTURAL TRADE WITH THE USSR, 1971–81

[In million dollars]

Commodity	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981[1]
Exports:[2]											
Wheat	0.7	160.0	556.6	124.1	672.7	264.2	426.8	355.8	813.2	336.1	782.3
Coarse grains[3]	26.3	232.7	359.9	176.1	457.8	1,180.2	412.4	1,109.4	1,572.0	684.7	827.1
Corn	24.5	186.5	294.5	159.5	452.6	1,170.1	412.4	1,109.4	1,540.9	684.7	827.1
Rice	—	—	—	—	9.2	15.3	25.2	6.0	9.1	—	—
Soybeans	—	53.6	87.2	—	2.9	126.4	154.4	222.1	494.1	45.3	8.8
Oilcake and meal	—	—	—	.5	—	—	1.5	.2	6.7	—	—
Soybean oil	—	—	—	—	—	—	—	—	15.8	—	—
Cattle hides	10.9	9.6	1.1	7.9	5.2	2.5	.8	8.1	3.2	.1	0
Fruits, nuts and berries	1.5	1.1	2.8	5.3	6.1	8.4	20.4	16.8	15.6	18.5	16.2
Tallow (inedible)	—	—	—	—	14.0	—	—	18.7	57.6	28.2	48.5
All other	5.2	2.4	9.5	9.8	2.4	7.8	[4] 11.3	[5] 28.0	12.8	16.8	[6] 37.6
Total	44.6	459.4	1,017.1	323.7	1,170.3	1,604.8	1,052.8	1,765.1	3,000.1	1,129.7	1,720.3
Imports:											
Animal and animal products	2.8	3.4	4.0	7.1	5.4	7.2	10.2	11.6	12.9	7.5	8.9
Casein and mixture	—	—	.2	2.0	1.7	.7	1.7	2.4	3.0	1.0	.3
Furskins	2.7	3.0	3.1	4.5	3.5	6.1	8.0	8.9	9.6	6.1	8.6
Bristles	(7)	.2	.5	.4	(7)	—	—	—	—	—	—
Gelatin	—	(7)	.3	.3	(7)	.1	(7)	—	—	—	—
Licorice root	.1	.2	.2	.2	1.1	.6	—	—	—	—	—
Tobacco fillers	—	—	—	—	—	—	—	.6	1.2	1.5	.9
All other	.1	.2	.2	.9	.7	.5	.7	.2	.6	.6	2.1
Total	3.0	3.8	4.7	8.5	7.2	8.4	10.9	12.4	14.7	9.6	11.9

—Equals negligible or none.

[1] Preliminary.

[2] Including transhipments through Canada, Belgium, the Netherlands, and West Germany.

[3] Includes corn, rye, barley, oats, and sorghum.

[4] Includes $4.5 million of peanuts.

[5] Includes $16.6 million of peanuts.

[6] Includes $15.6 million of sugar.

[7] Less than 450,000.

TABLE 4.—TOTAL SUPPLY AND ESTIMATE UTILIZATION OF GRAIN, USSR, 1971/72–1981/82[1]

[In million metric tons]

Year beginning July 1	Production[2]	Trade			Availability	Utilization						
		Imports	Exports	Net[3]		Seed	Industrial	Food	Dockage waste	Feed	Total	Stock change[3] [4]
Total grains and pulses:												
1971–72	181.2	8.3	6.9	+1.4	183	27	3	45	13	93	181	+2
1972–73	168.2	22.8	1.8	+21.0	189	26	3	45	15	98	187	+2
1973–74	222.5	11.3	6.1	+5.2	228	27	3	45	33	105	214	+14
1974–75	195.7	5.7	5.3	+0.4	196	28	3	45	23	107	206	−10
1975–76	140.1	26.1	0.7	+25.4	166	28	3	45	14	89	180	−14
1976–77	223.8	11.0	3.3	+7.7	232	29	3	45	31	112	221	+11
1977–78	195.7	18.9	2.3	+16.8	213	28	4	45	29	122	228	−16
1978–79	237.4	15.6	2.8	+12.8	250	28	4	46	28	125	231	+19
1979–80	179.2	31.0	0.8	+29.7	209	28	4	46	22	123	222	−13
1980–81[5]	189.2	34.8	0.5	+34.3	223	27	4	47	28	122	228	−5
1981–82[6]	160.0	46.0	0.5	+46.0	206	27	4	47	16	112	206	0
Wheat:												
1971–72	96.8	3.5	5.8	−2.3	97	15	1	35	7	36	94	+3
1972–73	86.0	15.6	1.3	+14.3	100	14	1	35	8	41	98	+2
1973–74	109.8	4.5	5.0	−0.5	109	14	1	34	16	30	96	+13
1974–75	83.9	2.5	4.0	−1.5	82	14	1	34	10	34	93	−11
1975–76	66.2	10.1	0.5	+9.6	76	15	1	35	7	30	87	−11
1976–77	96.9	4.6	1.0	+3.6	100	15	1	35	14	28	92	+8
1977–78	92.2	6.6	1.0	+5.6	98	15	1	35	14	44	108	−10

TABLE 4.—TOTAL SUPPLY AND ESTIMATE UTILIZATION OF GRAIN, USSR, 1971/72–1981/82[1]—Continued

[In million metric tons]

Year beginning July 1	Production[2]	Trade			Availability	Utilization						
		Imports	Exports	Net[3]		Seed	Industrial	Food	Dockage waste	Feed	Total	Stock change[3] [4]
1978–79	120.8	5.1	1.5	+3.6	125	14	1	35	14	43	107	+18
1979–80	90.2	12.0	0.5	+11.4	102	15	1	35	11	53	115	−13
1980–81[5]	98.1	16.0	0.5	+13.0	114	15	1	36	15	50	117	−3
1981–82[6]	80.0	19.5	0.5	+19.0	99	15	1	36	8	39	99	0
Coarse grains:[7]												
1971–72	72.6	4.3	0.9	+3.4	76	10	2	7	5	51	76	0
1972–73	72.5	6.9	0.4	+6.5	79	11	2	7	7	53	79	0
1973–74	101.0	6.4	0.9	+5.5	106	11	2	7	15	70	105	+1
1974–75	99.7	2.7	1.0	+1.7	101	11	2	7	12	68	100	+1
1975–76	65.8	15.6	0	+15.6	81	12	2	7	7	56	84	−3
1976–77	115.0	5.7	2.0	+3.7	119	12	3	7	16	78	116	+3
1977–78	92.6	11.7	1.0	+10.7	103	11	3	7	14	74	109	−5
1978–79	105.0	10.0	1.0	+9.0	114	12	3	7	13	79	113	+1
1979–80	81.0	18.4	0	+18.6	100	12	3	7	10	68	100	−0
1980–81[5]	81.0	18.0	0	+18.0	99	11	3	7	12	68	101	−2
1981–82[6]	72.0	25.5	0	+25.5	98	11	3	7	7	70	98	0

[1] Rounded to the nearest million tons, except for production and trade data. Thus, totals may not add due to rounding.
[2] Calendar year basis.
[3] Minus indicates net exports or drawdown of stocks.
[4] Difference between availability and estimated total utilization.
[5] Preliminary.
[6] USDA estimate.
[7] Includes rye, barley, oats, corn, and millet.

Appendix B. Soviet Grain Buying Practices

By Cynthia Robertson

Much of the research on U.S.-USSR grain trade has focused on the macro-aspects of aggregate production figures and trade data. It is more difficult to find information on specifics, such as contract terms preferred by the Soviets, methods of payment, credit assistance, Soviet quality preferences for wheat and corn, and Soviet regulations or restrictions that apply to this trade. Surprisingly, much of this information is available, though seldom collected for a general audience. This appendix, therefore, is an attempt to provide some of that information in a useful manner without revealing business confidential data of specific firms.

V/O EXPORTKHLEB

Grain trade with the USSR is a closely supervised and controlled function of one Soviet agency, the All-Union Association for Import/Export of Grain and Grain Products (V/O Exportkhleb). This organization is the one which enters into contract negotiations with foreign exporters of grain.

V/O Exportkhleb, one of 49 Foreign Trade Organizations (FTO's) operating under the USSR Ministry of Foreign Trade, is comprised of three operating firms: Firm Zerno, which deals with export/import of food and feed grains; Firm Prodsyrio, which deals with export/import of oilseeds, legumes, cereals, flour, bran, and other food and feed raw materials; and Firm Semena, which deals with seeds and planting materials.

In addition to having the responsibility for entering into trade contracts, Exportkhleb is also responsible to the Ministry for contributing expertise in plan formulation. Each of the separate firms give their requirements to a central administration of the FTO which consolidates them and presents them to the Ministry. The Ministry uses these draft requirements from Exportkhleb and the other FTO's as recommendations for use by the State Planning Committee (Gosplan) in formulating the overall foreign trade central plan. Upon authorization by Gosplan, the Ministry of Foreign Trade is given its official requirements, which, in turn, are provided to the appropriate FTO's. Exportkhleb, through the plan period, will enlist its firms to make the necessary transactions. Given the unpredictable nature of agricultural production, it is often impossible to predict the amount of imports the Soviets will need in a given plan period. Minimum requirements can usually be based on past production and consumption experiences, but plan adjustments are likely to be made throughout the process.

CONTRACTS

The contracts that individual exporters use in dealing with Exportkhleb apparently differ little in form or content (apart from the transaction-specific data, such as quantities and prices). Although a standard form has been prepared by the North American Export Grain Association, to which all major U.S. grain exporters belong, this standard form is not used in transactions with the USSR. Indeed, most transactions, whether with the Soviets or with other importers, include modifications to suit the needs of one or the other parties. Generally, however, modifications are usually at the request of the buyer, with special requests or options being treated as an added cost. The Soviets use their own contract form, rather than a modification of the NAEGA contract, although many of the terms are identical. Over the years contracts with the Soviets have become fairly standardized, and all major exporters would immediately recognize "Soviet terms."

METHODS OF PAYMENT

The actual method of payment is in terms of "cash-against-documents," wherein the full amount due is transferred from the USSR Foreign Trade Bank (Vneshtorgbank) directly to the seller's account. With U.S. sellers (possibly with most sellers) payment is made in U.S. dollars. An October 1972 U.S.-USSR Trade Agreement (which never entered into effect) stated that all currency payments were to be made in either U.S. dollars or other freely convertible currencies. The inconvertibility of the ruble may be of some benefit to U.S. exporters since they do not have to hedge against either dollar-ruble exchange rates or price their commodities in ruble value.

Before payment is made, documents must be presented to the seller's bank (or, with the seller's consent, another bank designated by V/O Exportkhleb as its Western correspondent) within 3 days of vessel loading. These documents, include invoices, bills of lading, a quarantine/phytosanitary certificate showing that the grain was free from weevils, weeds, and diseases, a fumigation certificate, a certificate of quality issued by the Federal Grain Inspection Service (FGIS) of USDA, an official weight certificate issued by FGIS, and finally a certificate of inspection of the vessel that would transport the grain.

The United States Grain Standards Act states that all grain leaving the United States must be weighed and officially inspected by the FGIS. Inspection is carried out from a sample taken when the grain is being loaded on board the transporting vessel or after the loading process is completed. Inspection may be waived, however, by mutual consent of the trading partners.

Because the Soviets demand rigid quality specifications for their imported grain, it is not likely that they would waive their right to inspect. A licensed grain inspector will assign the grain sample a grade based on specific characteristics of the tested grain—such as damaged kernels, moisture content, test weight and etc.—as designated by the Official U.S. Standards for Grain. Findings are then submitted to the exporter who in turn presents them to his bank in order to complete the transaction.

QUALITY PREFERENCES

Since 1977, the Soviets have purchased only No. 2 Hard Red Winter wheat from the United States. A very small purchase of Durum wheat was made in the 1976/77 marketing year, and previously, a small purchase of Hard Red Spring wheat occurred. Import requirements of Durum wheat usually are met in Canada with Argentina as a second source. The Soviets usually buy spring wheat in Canada, possibly to reduce the chances of Ergot infestation.

"Soviet terms" usually specify U.S. No. 2 or better, Hard Red Winter wheat, of a specific crop year with a minimum of 11 percent protein, dark hard vitreous kernels minimum of 40 percent, moisture, 13.5 percent maximum. U.S. grain standards deal primarily with the extent of damage to kernels, rather than the protein content, moisture content, or percent of dark hard vitreous kernels. Usually, a higher percentage of dark hard vitreous kernels corresponds to higher protein content. Moisture content is usually lower than the maximum the Soviets will allow.

The Soviets purchase No. 3 or better yellow corn with a maximum moisture content of 15–15.5 percent. Protein content is not an important characteristic for corn.

CREDITS

Credit arrangements between the USSR and U.S. enterprises or U.S. Government agencies are limited by U.S. legislation, the two most important being the Johnson Debt Default Act of 1934 and the Trade Act of 1974. The Johnson Act prohibits loans from private companies to those countries that have defaulted in paying debts to the U.S. Government or private U.S. companies, unless these countries are members of both the International Monetary Fund and the International Bank for Reconstruction and Development. The USSR, being a member of neither, and considered in default of obligations dating back to Czarist Russia, is covered.

The Johnson Act prohibits private financing not tied to a particular export or project, or financing for a longer duration than is customary for a particular export. Thus, short-term private credits, according to an Attorney General interpretation in 1972, are not prohibited and some may have been used to finance grain sales to the USSR in 1982. In addition, U.S. overseas subsidiaries can provide funds raised outside the United States.

While Soviet purchases were usually cash against documents, the Soviets began seeking short term private financing towards the end of 1981. Interestingly, the press release from the consultations which occurred in May 1982 included a statement of policy which indicated that private credit arrangements were accompanying recent grain sales, and that the United States had "no problem" with these arrangements.

The Trade Act prohibits the U.S. Government from extending credits or credit guarantees to Communist countries with restrictive emigration policies. Yugoslavia and Poland were not covered by this provision and waivers are in effect for Romania and Hungary. This provision applies as well to U.S. agencies such as the Export/Import Bank, the Commodity Credit Corporation (CCC) of the U.S. Department of Agriculture, and the Overseas Private Investment Corporation.

The last long-term credit extension offered to the USSR by the U.S. Government was embodied in connection with the grain sale of 1972. The CCC was authorized to lend to the USSR up to $750 million, of which only $500 million could be borrowed at any time. The Soviets took advantage of about $550 million of this extension, which was paid back in the next three years. Interest on the loan (which fluctuated between 6⅛ percent and 9½ percent) reached a total of about $150 million during the 3-year loan period.

If credits to the USSR were not so restricted, the Soviets would still be at a disadvantage in obtaining credits in the United States. U.S. lending laws state that the legal limit for lending to any borrower is 10 percent of the bank's gross capital fund. Vneshtorgbank being the only borrowing organization for the Soviet Union considerably limits the USSR's borrowing potential, as compared to that of a capitalist country which usually has a number of borrowers.

TRANSPORTATION

Grain exports to the USSR travel by sea. Vessels used in this trade vary from 15 to 80 thousand metric tons in capacity. Soviet purchases are in bulk, with a 5 percent weight tolerance at the buyer's option.

To save on hard currency, the USSR prefers to use its own flag ships, but Soviet ships have been available only about 15 percent of the time. The U.S.-USSR Maritime Agreement expired on December 21, 1981, but its termination did not seriously disturb shipments. According to the U.S. Maritime Administration, third-country ships carried almost 70 percent of U.S. grains since the Agreement's inception in 1972.

The U.S. exporting company is responsible for inspecting the vessel used to transport the grain to ensure that the grain arrives in the Soviet Union in the same condition it left the U.S. port. The inspector oversees the condition of the vessel ensuring that it is free from rust, glass, infestation, and foreign odors. The buyers, however, with the consent of the seller, reserves the right to send a representative to inspect both the vessel and the grain prior to loading. If on arrival at the point of destination it is found that the grain contains live insects, and other foreign matter, V/O Exportkhleb will arrange for fumigation and cleaning at the seller's expense.

Copies of the quality, phytosanitary, and fumigation certificates must arrive at the port of discharge before the vessel. If a vessel arrives before the documentation, the seller will be responsible for the vessel sitting idle.

Transportation insurance is the responsibility of V/O Exportkhleb, which notifies the seller of the insurance purchase prior to loading (usually 5 days). Soviet imports from the United States cannot be insured by either the Foreign Credit Insurance Association (FCIA) or Export/Import Bank because of the provisions of the Trade Act of 1974. Although some private insurance companies have participated in Soviet grain trade, the Soviets prefer to use their own companies. Since grain purchases are financed by the Soviet Government, any loss through damage or theft of the grain in transport is sustained by the Government. Thus, an insurance provision is seemingly unnecessary for the Soviets. However, U.S. exporters in order to protect themselves from any liability accrued during transport, insist on the insurance provision.

In addition to the various rules concerning transportation, the U.S. shipper must follow a set of guidelines when entering a Soviet port. These guidelines are outlined in the USSR Notice to Mariners, Special Instructions for Vessels Calling at USSR Ports, General Rules for Soviet Merchant and Fishing Sea Ports, and the Customs and Obligatory Harbour Regulations. Ports in the USSR must be notified by a shipper 48 hours in advance of the arrival. They must state the name and flag state of the vessel, the length and draft, the nature and quantity of the cargo to be discharged, the health and sanitary conditions of the ship, and the estimated time of arrival. The Soviet organization Inflot is the agency which accepts this information, which serves as a translator for the ship captain and his crew, and which arbitrates on their behalf in case of a conflict. In general, Inflot facilitates the work of a foreign shipper while docked in any Soviet port.

ARBITRATION

"Soviet terms" specify that should a dispute arise over the interpretation, performance, or breach of contract, the Foreign Trade Arbitration Commission at the USSR Chamber of Commerce in Moscow will be the final decision making authority. Its awards are to be binding on both parties. The extent of grain contracts entering arbitration is not known.

APPENDIX C. SOVIET GRAIN ESTIMATING METHODOLOGY

By James E. Cole

The authors' projections of Soviet grain supply and utilization are consistent with those in general use in USDA. Soviet grain import demand is calculated as a residual of total grain production and the estimate of the individual grain utilization components (dockage/waste, seed, food, industry, livestock feed, and stock changes).

Total grain production is forecast using a linear function of the form:

$$\text{Grain Production}(t) = C1 + C2 \times QT50$$

Where C1 and C2 are intercept and slope coefficients respectively, and QT50 is a simple time trend (in this case beginning in 1950). Production estimates incorporated in this paper were actually determined using the following equation:

$$\text{Grain Production}(t) = \underset{(8.8)}{102.5} + \underset{(5.8)}{3.2} \times QT50$$

Values in parentheses represent T-statistics, both of which are well within reasonable bounds. The range used in this ordinary least-squares regression was 1955 to 1982. The relatively low R^2 of .563 can be explained by the incorporation of estimated production for 1981 and 1982, both years for which USSR grain production was abnormally low. If 1981 and 1982 are excluded from the range, the R^2 surpasses .700. The authors decided to include the estimates for the two most recent years in the regression estimates knowing that they may well prove to be outliers. On the other hand, they may be signaling a new trend in Soviet grain production. The standard error of the estimate was 23.6 and the sum of the squared residuals was 14,530—both due to relatively large residuals in the past four years, and again, not unexpected. The Durbin-Watson statistic was quite good (as expected in an equation of this form) at 2.13.

Dockage/waste is included in the estimates of total utilization of grain and it represents a deduction for excess moisture and nongrain materials gathered in harvest. It is necessary since the Soviets report grain production on a "bunker weight" basis, i.e., the quantity of grain as it comes from the combine. Dockage/waste estimates largely reflect precipitation levels at harvest, and since 1972 have varied between 9 and 15 percent of Soviet grain production with 10 percent representing an "average" year.

The estimate of seed use is calculated by grain by year according to the following equation:

$$\text{Seed}(t) = \text{Seed Rate} \times \text{Area}(t+1)$$

The seeding rate varies from grain to grain, and also varies over time to take into account advances in seed quality and improved sowing techniques.

Detailed tables of seeding rates have been kept by the EE-USSR Branch since 1955. USDA adjusts the seeding rates upward every five years to reflect quality changes and improved sowing practices. The range of seeding rates used (in kilograms per hectare, by grain type) are detailed in the following table:

Grain	*Seeding rate*
Barley	145–220
Buckwheat	75–110
Corn for feed	25–40
Corn for grain	15–30
Millet	20–35
Miscellaneous grains	100–240
Oats	145–220
Pulses	165–260
Rice	175–260
Rye	145–220
Spring wheat	145–220
Winter wheat	145–240

The food estimates were calculated by grain in the following three manners:

1. as a function of reported flour production;
2. as a function of population; and
3. as a residual for grain whose stocks are assumed to be minimal and are not consumed as feed.

The food calculation for both wheat and rye are directly linked to flour production. It is assumed that all flour is made from either wheat or rye, as flour milled from buckwheat and other miscellaneous grains is of minor importance:

Food consumption = per capita flour consumption × population × (flour/grain conversion ratios) − adjustments for miscellaneous grains and pulses.

Specifically, flour consumption is directly determined using the per capita flour consumption figure from *Narodnoye Khozyaistvo* for various years and the population estimates either from the same source or from U.S. Department of Commerce estimates. From that figure an estimate of groats consumption is deducted (calculated independently from the oats and barley balances) as well as an additional deduction for miscellaneous grains.

The per capita flour consumption numbers from the *Narodnoye Khozyaistvo* used in calculating the wheat and rye food consumption numbers are as follows:

USSR per capita flour consumption

Year:	*Kilograms*
1965	156
1970	149
1974	142
1975	141
1976	141
1977	139
1978	140
1979	138
1980	139

The sharing of flour consumption into the components of wheat and rye is based on the assumption that the wheat share has risen steadily since 1955, while that of rye has declined. Although the annual increments are small, the shares used by the Economic Research Service are:

	Wheat share	Rye share
1955	0.75	0.25
1980	.85	.15

Food consumption of barley, corn, millet, oats, and pulses are calculated on the basis of population estimates alone and grain consumption parameters alone. Per capita consumption data for these grains are not published but are thought to range from a low of 1 metric ton per 1000 population for barley, to a high of 4 metric tons per 1000 population for millet. Buckwheat and rice consumed as food are calculated on a residual basis after deducting all other utilization categories. Finally, it is assumed that none of the miscellaneous grains are consumed as food.

Industrial uses of grain are calculated for barley, corn, and wheat only as industrial uses of all other grains are assumed to be minimal. This calculation is determined as a function of reported and estimated production levels of malt, corn starch, corn syrup, and alcohol.

Livestock feed estimates are determined by analyzing Soviet feed-livestock relationships, estimates of meat production and also oilmeal consumed as feed. The best statistical relationships proved to be between grain fed one year and meat production the next. The equation used to estimate grain for feed was of the form:

$$\text{Meat Production}(t) = f(\text{Grain Fed}(t-1))$$

The strong relationship between the current-period's meat production and the lagged-period's grain fed is illustrated in the following equation using 1966 to 1981 as a range:

$$\text{Meat Production}(t) = 7190.5 + 67.5 \times \text{Grain Fed}(t-1)$$

$$(18.6) \quad (17.1)$$

The numbers in parentheses represent T-statistics as noted above. As in the case of estimating grain production, most of the statistics were more than satisfactory. The R^2 of .954 is certainly not unexpected given the nature of the equation (corrected R^2 of .950). The standard error was 356.5, while the sum of the squared residuals was 1.78E06—each rather large due to both the absolute size of the units involved in the raw data, and some problems associated with what appear to be outlier years. Only the Durbin/Watson statistic was less satisfactory at 1.27. For the period beyond 1981, the authors estimated annual meat production. The results were modified on the basis of the assumptions of the relative positions of grain and non-grain feeds in the total livestock feed mix as noted in the text. Meat production estimates used in the forecast period are as follows:

Year:	Meat production[1]
1983	15.7
1984	16.2
1985	16.8
1986	17.5
1987	18.2
1988	19.0

[1] Million tons.

Grain stock changes were exogenously determined. We feel that the Soviets would prefer to rebuild stocks to about 45 million tons, but that trade-offs associated with year-after-year grain imports in the 40 million ton range ton range might lead them to either settle for less, or take a longer time to rebuild.

Estimates of the various utilization and supply categories are regularly distributed within the Department of Agriculture for suggestions for refinement and opinions of implied trends. Additionally, expert opinion is sought from agencies and departments outside USDA and from analysts within the private sector. We welcome readers' comments or suggestions.

Figure 1

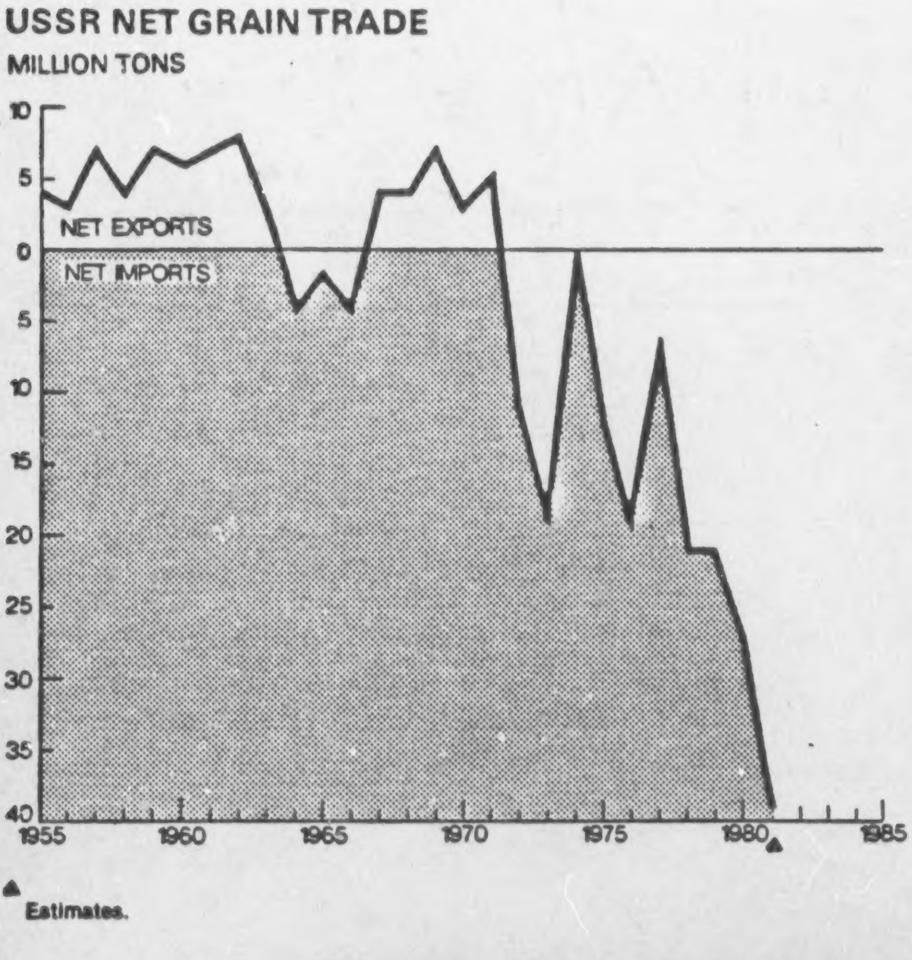

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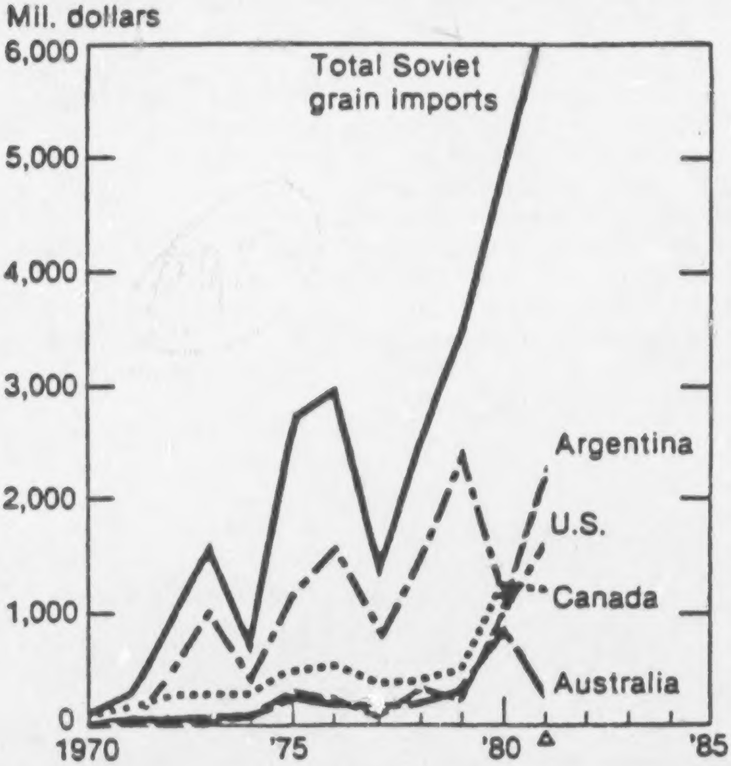
Figure 2

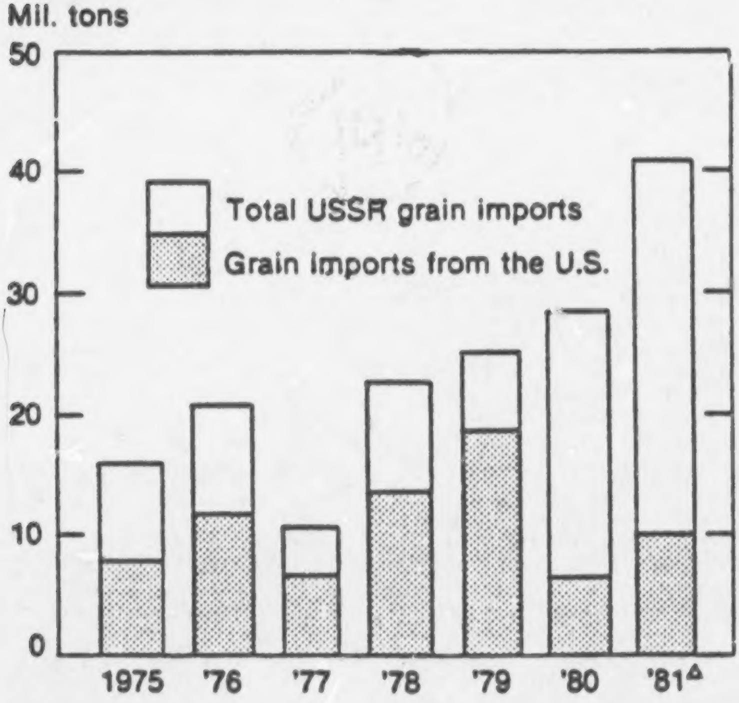
USSR Grain Imports by Country of Origin 1970-1981



△Estimates.

INSE Figure 3

USSR Grain Imports, Total, and from the United States



ΔEstimates.

SOVIET LIVESTOCK: STYMIED GROWTH, INCREASED COST AND SEARCH FOR BALANCE

By Kenneth R. Gray*

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I. SUMMARY AND INTRODUCTION

Growth of Soviet livestock production in the tenth five-year plan (1976-80) and in 1981, the first year of the eleventh plan has stagnated. Increase of the tenth over the previous, ninth, plan (1971-75) was only 8 percent compared to much larger growth in the first Brezhnev-era 5-year plans.

Still, previous growth of meat consumption had implanted the Soviet Union, albeit at the lower end, well within the spectrum of other European nations. With respect to annual average consumption of animal source protein the Soviets now appear quite high on the world list.

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The proximate cause of the stagnation of livestock growth is four years of poor grain harvests, in 1975, 1979–81. Even after three consecutive bad harvests the Soviet Union began 1982 with a record number of total animals and with the cooperation of the weather seems poised to rebegin substantial growth in the remainder of the eleventh five-year plan.

A more basic challenge for Soviet agriculture, including the livestock sector, is to reverse the recent accelerating resource cost of production. Numerous possibilities for the redirection of resources to more productive ends exist, and some of these seem to be addressed in the investment program for the current five-year plan, and in an emerging Soviet conception of an inclusive "food complex."

I. PROGRESS OF THE EIGHTH AND NINTH 5-YEAR PLANS

In the last half of the 1970s Soviet livestock products consumption hit a plateau. Proper perspective, however, requires notice of how far the Soviet Union had come and where it now stands since the March 1965 Party Plenum on Agriculture began funnelling increased resources into agricultural production in the eighth and ninth five-year plans (1965–1975). Over a ten-year span, average per capita consumption of livestock products rose as follows: [1]

	Percent
Milk and milk products	24
Eggs	60
Red meat and poultry	33

This spurt of growth achieved for the Soviet Union the relative position among European nations for average consumption of meat depicted in Table 1. This table derives from the U.N. Economic Commission for Europe's efforts to make comparable consumption statistics for twenty-six European countries. The 1975–79 plateau provided the Soviets fifth place in per capita beef consumption. A much lower pork and poultry position caused a ranking of only twenty-first (between Finland and Romania) in consumption of all red meat and poultry. In absolute terms, the levels achieved left the Soviet Union solidly in the ranks of other European nations. Britain consumed only 16 percent more meat, and Sweden only 9 percent more per capita than the Soviet Union during this period.

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[1] Derived from the Narodnoe khoziaistvo SSSR (various years) per capita consumption tables as average 1974–77 increase over average 1964–67.

TABLE 1.—USSR AND OTHER EUROPEAN COUNTRIES RANKED BY APPARENT PER CAPITA CONSUMPTION OF RED MEATS AND POULTRY FOR 1975–79 (kilograms)

[Revised July 1, 1982]

Rank	Beef and veal		Pig meat		Poultry		Sheep meat [1]		Total red meat and poultry [2]		Index USSR equals 100
1	France	32.1	GDR	51.7	Spain	19.8	Iceland	48.9	France	86.9	164
2	Belgium	28.3	GFR	46.0	Hungary	18.4	Greece	13.4	Belgium	84.4	159
3	Ireland	25.8	Belgium	43.6	Italy	16.8	Ireland	9.6	GDR	84.0	159
4	Switzerland	25.6	Hungary	43.3	France	15.3	UK	7.4	GFR	79.3	150
5	USSR	25.5	Czechoslovakia	40.6	Romania	13.6	Bulgaria	7.0	Austria	78.2	148
6	Austria	25.2	Switzerland	39.9	Bulgaria	12.8	Norway	5.5	Ireland	76.1	144
7	Czech	25.0	Poland	39.7	Ireland	12.5	Spain	4.0	Czechoslovakia	75.3	142
8	Italy	23.9	Denmark	37.2	Portugal	12.5	France	3.8	Switzerland	73.6	139
9	Finland	23.3	France	35.7	UK	12.2	USSR	3.7	Hungary	70.8	134
10	GFR	23.2	Austria	35.0	Bel-Lux	10.8	Romania	3.5	Poland	68.3	130
11	GDR	22.4	Sweden	34.0	Yugoslavia	10.4	Portugal	2.6	Iceland	62.5	118
12	Greece	21.8	Netherlands	33.6	Greece	10.4	Yugoslavia	2.6	Italy	62.2	117
13	UK	21.5	Finland	29.0	Austria	10.0	Belgium	1.8	Netherlands	62.2	117
14	Netherlands	21.0	Ireland	28.2	Czechoslovakia	9.6	GDR	1.5	UK	61.2	116
15	Poland	19.7	Bulgaria	27.2	GFR	9.3	Switzerland	1.2	Denmark	59.9	113
16	Norway	18.9	Romania	25.0	Poland	8.8	Italy	1.1	Greece	59.1	112
17	Sweden	18.8	Spain	21.1	GDR	8.4	GFR	.8	Bulgaria	58.7	110
18	Denmark	14.5	Norway	20.4	Denmark	8.2			Sweden	57.6	109
19	Yugoslavia	13.5	Italy	20.4	Netherlands	7.6			Spain	57.5	109
20	Spain	12.9	United Kingdom	20.1	Switzerland	6.9			Finland	54.9	103
21	Portugal	12.0	Yugoslavia	18.1	USSR	6.9			USSR	52.9	100
22	Bulgaria	11.6	USSR	16.8	Sweden	4.8			Romania	51.5	97

23	Iceland	10.5	Portugal	15.1	Finland	2.6			Norway	47.1	89
24	Romania	9.4	Greece	13.5	Norway	2.3			Yugoslavia	44.5	84
25	Hungary	9.0	Iceland	3.1					Portugal	42.3	80
26	Turkey	5.3									
	USA	55.4	USA	27.5	USA	24.7	USA	.8	USA	108.4	[3] 205

ECE discount official Soviet production data (uboinyi ves) for slaughter fat by these amounts: beef—7 percent, pork—15 percent and sheep meat—4 percent.

[1] For nations with more than one kilogram; includes goat meat.

[2] Beef and veal, mutton, lamb and goat meat, pork, plus poultry.

[3] U.S. data is from Agricultural Statistics 1981 (Washington: USDA, 1982), pp. 350 & 552 and in carcass weight equivalent, excluding edible offals, except poultry, which is retail weight.

Sources: Economic Commission for Europe, Review of the Agricultural Situation in Europe at the End of 1980 (New York: United Nations/ECE, 1981). Apparent consumption is carcass weight excluding slaughter fat and offals, plus net imports. No adjustment is made for changes in inventories.

Due to relatively high consumption of milk and fish, the Soviets also did well in their consumption of animal-source protein, an important indicator of quality of diet. According to the Food and Agricultural Organization of the United Nations, in 1972–74 Soviet average intake of calories from livestock products and fish was more than twice the world level. Even discounting for definitional differences in official Soviet data to make it internationally comparable, Soviet consumption of animal source protein may have exceeded the European average, and it appeared to be about 70 percent of the American per capita level.[2]

If the above picture comes as a surprise to any reader, it may be because problems of distribution and Soviet retail price policy color our perception. Poor distribution, storage and transportation cause availability of supply to vary greatly from place to place and time to time—and thus queues. The 57 kilos of meat (Soviet carcass weight definition) consumed annually by Soviet citizens is purchased with accompanying frustration and considerable waste of time, and in a real sense is not the same as an identical amount purchased in varied assortment, any time at equilibrium prices. That retail prices for meat that have remained frozen since 1962 cause shortages can be appreciated by any American consumer of gasoline who experienced the "no gas" situation of the summer of 1979, during which time of price controls only a few percent less gasoline was sold than in the same period of the previous year.[3]

Per capita consumption of meat in the Soviet Union is still only one-half the level of the U.S. and still far below the official dietary norm of 82 kilograms which, established by the Soviet Academy of Medical Sciences, can be taken as the long-term goal of Soviet planners.

III. STAGNATION AND CHANGING COMPOSITION IN THE 10TH 5-YEAR PLAN

Official Soviet statistics show that the total gross output in constant prices of the Soviet livestock sector in 1976–80 was only 8 percent above that of the previous five-year plan.[4] Average annual production of meat (including poultry) and milk each increased only 6 percent in 1976–1980 compared to 1971–75, while growth in the eighth (1965–70) and ninth (1971–75) plan periods had been 15 percent and 21 percent (respectively) for meat, and 15 percent and 8 percent for milk. (See Table 2.)

---

[2] United Nations Food and Agricultural Organization. Production Yearbook-1977. (Rome: FAO, 1978).

[3] In Tokyo boneless chuck roast sells for over $20 per kilo and is always available, though the Japanese citizen consumes less red meat than does a Russian. Those who would doubt the basic validity of Soviet published statistics on food consumption should know that emigré retrospective budget studies tend to support them. In collective farm markets where the price of meat is uncontrolled and recently three times that of state stores, meat is freely available. See also K. Gray, "Soviet Consumption of Food: Is the bottle 'half-full,' 'half-empty,' 'half-water,' or 'too expensive'?" ACES Bulletin, Vol. 23, No. 2 (Summer 1981). For some quantitative information on the seasonality of meat production see the last section of this paper.

[4] Narodnoe khoziaistvo SSSR v 1980 (Moscow: Finansy i statistika, 1981), p. 207. The Soviet valovaia produktsiia concept can involve some double counting.

TABLE 2.—SOVIET LIVESTOCK PRODUCTION ON ALL FARMS

Year	All meat	Milk	Eggs	Beef	Pork	Mutton	Poultry
1953	5,822	365	161	2,090	2,305	714	513
1954	6,281	382	172	2,091	2,715	709	480
1955	6,322	430	185	2,181	2,527	826	455
1956	6,598	491	195	2,348	2,666	829	475
1957	7,374	547	223	2,407	3,344	777	584
1958	7,700	587	230	2,715	3,264	885	600
1959	8,916	617	256	3,217	3,641	1,048	729
1960	8,682	617	274	3,252	3,276	1,019	766
1961	8,700	626	293	2,864	3,704	1,006	813
1962	9,462	639	391	3,277	4,011	1,062	822
1963	10,195	612	285	3,741	4,267	1,119	802
1964	8,287	632	267	3,571	2,813	1,052	606
1965	9,856	726	291	3,917	4,143	1,013	696
1966	10,704	760	317	4,377	4,465	933	745
1967	11,515	799	339	5,031	4,456	1,028	764
1968	11,648	823	357	5,513	4,079	1,029	817
1969	11,779	815	372	5,569	4,094	969	866
1970	12,278	830	407	5,393	4,543	1,002	1,071
1971	13,272	832	451	5,536	5,277	996	1,183
1972	13,633	832	479	5,722	5,445	923	1,237
1973	13,527	883	512	5,873	5,081	954	1,295
1974	14,628	918	554	6,384	5,515	974	1,420
1975	14,968	908	574	6,408	5,651	1,014	1,539
1976	13,583	897	562	6,600	4,343	900	1,400
1977	14,722	949	612	6,900	5,000	900	1,700
1978	15,501	947	645	7,100	5,300	900	1,900
1979	15,481	933	656	7,000	5,300	900	2,000
1980	15,000	906	678	6,700	5,100	800	2,100
1981[1]	15,200	885	790				
1981–1985	17,100	981	790				

[1] Preliminary. Sources: Proizvodstvo produktov zhivotnovodstva (Moscow: TsSU, various years); Narodnoe khoziaistvo v 1980; Izvestiia, Jan. 23, 1981; Plan figures from Ekonomika sel'skogo khoziaistva, No. 12, 1981.

All figures are thousand tons except eggs which are billion units. Meat is Soviet carcass.

As a result, the 57 kilograms of red meat and poultry (Soviet carcass weight definition) consumed annually by the average Soviet citizen in 1976–1980 just equalled the (record) per capita consumption of 1975, the last year of the ninth plan. Per capita milk and milk products consumption also stalled at a 1976-80 average of 318 kilograms equivalent weight, only slightly above the 1975 record. This performance was repeated by fish consumption, which after 36 percent growth over the previous ten years, settled at a 17.3 kilogram level of 1976–1980. Among sources of animal protein only poultry consumption rose consistently: consumption of eggs was 216 in 1975, and 238 per person in 1980.[5]

The proximate causes of this stagnation lie in the disastrous grain harvest failures of 1975 and the subsequent consecutive poor harvests of 1979, 1980 and 1981. The 1975 grain harvest which was 28 percent below both trend and the previous year's level, caused a 20 percent liquidation of swine inventory (Jan. 1, 1975–Jan. 1, 1976) and a 0.6 percent reduction of cattle. The resultant 9 percent decline in total meat production in 1976, the first year of the tenth five-year plan, was almost recovered by 1977. Only in the third year of the tenth plan, was the first growth of meat production over 1975 recorded: a record 15.5 million metric tons (Soviet carcass weight). From that temporary high in 1978 meat production declined, accompanying the grain harvests of 1979 and 1980 which were each about 15 percent below long run trend.

---

[5] Narodnoe khoziaistvo (1981), p. 405.

The decline in the total weight of meat production may have been countered in part by increased quality. In a single year, 1977, the amount of total concentrate feed fed increased by 22 percent, then increased again in 1978 and 1979. The level was retained in 1980.[6] Accompanying this surge of concentrates was not only substantial poultry and egg growth, but continued increase in the long-criticized average slaughter weight of Soviet cattle. Averaging 350 kilograms (live weight) for 1976-1980, Soviet cattle were much lighter than American cattle (which lately average 430 kilos) but much heavier than in the previous five-year plan, when cattle sold to the government from all categories of farms averaged only 321 kilograms. (Before the intensification program associated with the March 1965 Plenum, Soviet cattle were slaughtered at an average 250 kilograms or less.)

The tenth five-year plan saw a change in the composition of meat production. In the ninth planning period (1971-75) pork production had increased more rapidly than meat production as a whole, to 39 percent of the total. The share of beef fell to 42 percent. In the relatively "grain-starved" 1976-1980 period total pork production fell absolutely by 7 percent from the amount produced in 1971-1975. This decrease was approximately equalled by the increase of production of another grain consumer—poultry. The small 800 th. ton increase in the average annual total meat production for 1976-1980 was thus accounted for by approximately such an increase in beef and veal production. During 1976-1980 beef accounted for 46 percent of total meat production.

This relative larger increase in beef production during 1976-1980 is explained by the distress slaughter of swine in 1975, and apparent record production of non-grain fodder suitable for cattle in the latter part of the period.[7]

THE SITUATION AFTER 1981'S RESULTS

During 1981, the first year of the new eleventh five-year plan, by preliminary estimates meat production was 15.2 million tons, an increase over the previous year and only 2 percent below 1978's record 15.5, but still 5 percent below plan. Apparently as a result, the Soviet Union increased its importation of meat and meat products 70 percent over the previous year's level, to 980 th. tons. This amount was also almost 60 percent larger than the previous record import level of 1977.[8] Milk production in 1981 also continued its slow, but continuous drop of several years, to 88.5 mmt., seven percent below the plan for that year.

---

[6] Narodnoe khoziaistvo (1981), p. 253 and previous years. Much of the time series on inventories, production, and feeding intensities discussed in this section are analysed in K. Gray, Soviet Livestock Cycles with United States Comparisons (January 1981) an unpublished report sponsored by the National Council for Soviet and East European Research, available from the author.

[7] The cumulative mid-October production of hay and haylage were record in 1980 and silage production was as good as it had been in three years. In 1981 hay and silage production apparently continued to grow. U.S. Attache, Moscow, "USSR Agricultural Situation Report," Feb. 1982.

[8] Izvestiia, January 23, 1981, Vneshnaia torgovlia SSSR v 1971-78 and Ekonomicheskaia gazeta, April 1, 1982, No. 14. p. 21.

However, the Soviet livestock sector at the end of 1981, though stagnated, had not been broken.

Soviet inventory policy in 1976–81 was one of cautious maintenance, even slight expansion of numbers (see Figures 1 and 2). Despite the three bad harvests of 1979–81, through January 1, 1982 neither inventories of swine nor cattle had really turned downward, as occurred in 1972 and 1975, immediately following poor harvests.

Cattle herd growth stalled in 1980 and grew less than one percent annually in 1979 and 1981, and swine inventories grew less than ½ percent in 1977 and fell only a few tenths of a percent in 1980 and 1981. The total number of "animal units" has grown continuously throughout. (Table 3.)

FIG. 1

JAN 1 SOVIET AND US CATTLE INVENTORIES, (MILLIONS)

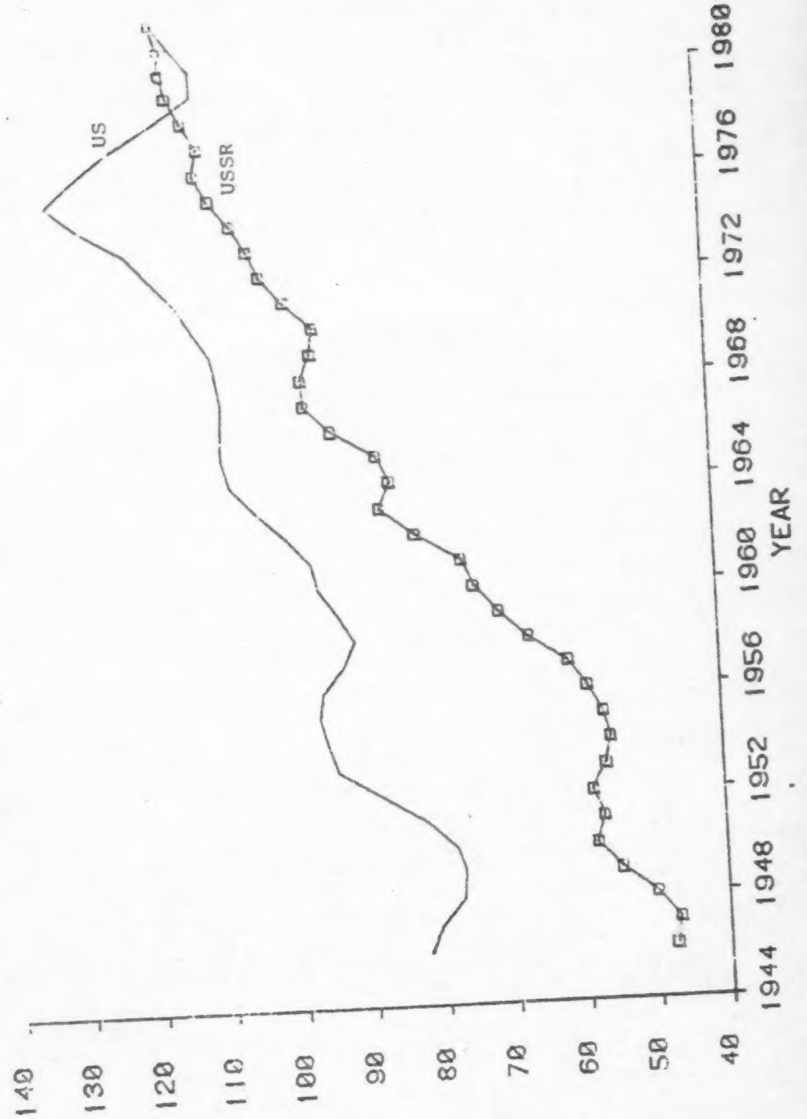

FIG. 2

JAN 1 SOVIET AND US SWINE INVENTORIES, (MILLIONS)

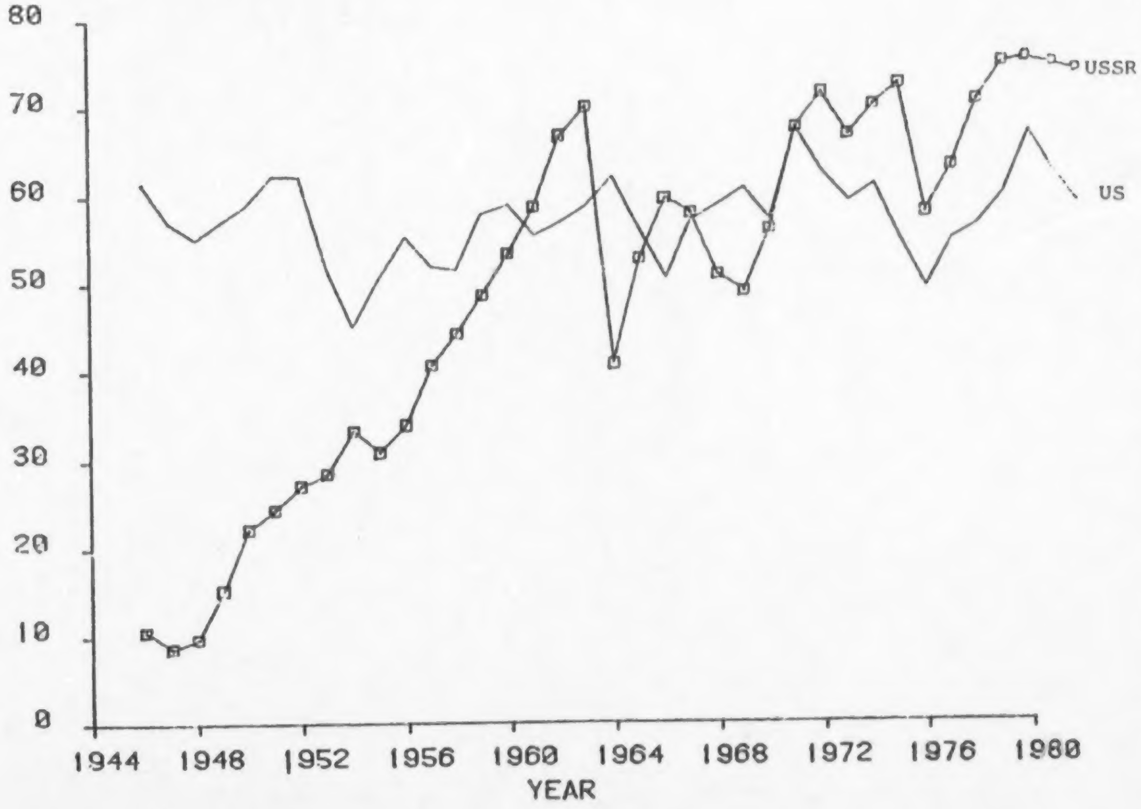

TABLE 3.—INVENTORY AND FEEDING INTENSITY INDICES—1970, 1975–81

Year	Total animal units (Jan. 1) [1]	Feed units/ animal units	Cattle slaughter weight	Swine slaughter weight	Milk yield
1970	122.6	24.8	309	107	2,110
1975	141.7	25.1	330	97	2,204
1976	136.5	25.5	330	97	2,179
1977	138.4	27.3	352	104	2,294
1978	143.9	26.9	361	105	2,260
1979	147.2	26.1	358	104	2,207
1980	148.7	25.7	350	101	2,143
1981	149.3		[3] down	[3] 101	[2] 2,100
1982	[4] 150.6				

[1] Weights: Cows & horses = 1, hogs = 0.3, sheep and goats equals 0.1, poultry equals 0.02.

[2] Estimate of Agricultural Counselor, Moscow, February, 1982.

[3] Estimate based upon Ekonomicheskaia gazeta average weights of cattle and swine sold by collective and state farms by the end of November, 1981. The cattle weight was 349 kilos, versus 354 kilos in 1980. The corresponding swine weight was unchanged.

[4] Preliminary.

Sources: Narodnoe Khoziaistvo SSSR v 1980 and earlier vols.

Table 3 shows various indices of feeding intensity: feed units per animal, cattle and swine slaughter weights, and milk yields. These have declined for from three to four successive years, in each case only from the record highs of 1977–1978, and in most cases not below 1971–75 averages.

Swine numbers will no doubt finally break downward significantly in 1982 following the 1981 grain harvest, the exact size of which is still unknown, yet apparently the smallest yet of three successive disappointments. This will position the eleventh planning period somewhat like the last, with reduced swine inventories early in the period, less able to fully absorb any subsequent harvest rebound. However, the lack of significant swine inventory liquidation by January 1982 with qualifications indicates that any inventory liquidation will not be so large.[9] Complete 1981 feeding intensity indices are unfortunately not available. Still, the relatively higher recent levels of feeding intensity—particularly of cattle—indicate a reserve for carrying over swine inventories until the 1982 harvest.[10]

Short-run inventory strategy during the current distress period will have its influence upon meat production in the eleventh five-year plan. At the same time, the longer-run perspective for growth depends more upon measures to reverse cost of production trends discussed in the next section.

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[9] Recent Soviet publications report two organizational constraints which cause delay of slaughter from the fall and early winter to the early months of the following year. These may have been less operative in 1972 and 1976 than in late 1979 following that year's poor harvest, and caused liquidation of swine to be held off. There was somewhat accelerated slaughter in the first three months of 1980, perhaps due also to the American grain embargo. (1) Farms are ineligible for receipt of the 50% premium to price for above-plan sales if the previous year's inventory levels for each individual type of animal are not retained to January 1 of the next year. (V.M. Iur'ev, "Stimulirovanie rosta zagotovok sel'skokhoziaistvennykh productov." Voprosy ekonomiki, No. 5, 1979, p. 68.) (2) The same author (Pravda, December 9, 1981, p. 2) argues that because farms cannot credit excess deliveries in one year to the next, farms which have already fulfilled the plan sometimes hold off deliveries until after January 1. Whether these factors have influenced events in 1981 (as opposed to 1972 and 1975) is not known.

[10] Ekonomicheskaia gazeta monthly livestock reports show the cumulative average weights of cattle sold by state and collective farms to the state through November 1981 to have been 349 kilograms, the lowest in several years, but still significantly above average weights in the ninth five-year plan. As a possible indication that concentrates may have been switched to swine inventory retention, the weight of such cattle marketed in April 1982 alone appeared to be only 336 kilograms, versus 349 kilos in April 1981.

IV. INCREASED COST OF PRODUCTION AND CHANGING STRUCTURE OF COST IN THE LIVESTOCK SECTOR

Twenty years of unaltered retail prices, plus increases in the cost of production of livestock products have led to the acceleration of state subsidies for the livestock sector, discussed by Vladimir Treml elsewhere in this volume. Table 3 indicates the extent of these subsidies for the RSFSR, where by 1978 one-half of total government expenses for production, processing and distribution of beef and mutton was covered by state subsidy. For pork and milk and milk products these costs exceed retail earnings and required subsidies of the order of 30%.

Table 4 shows the Soviet production cost (sebestoimost') for seven individual livestock products for the years 1966–1980. While sebestoimost' excludes rent and interest and otherwise comprises prices which in the Soviet economy fail to reflect accurately opportunity cost, these data are nonetheless helpful in understanding developments in the Soviet livestock sector.

According to Table 5, the increase in production cost has been enormous. The recorded unit cost of mutton, wool and beef on state and collective farms in 1980 was approximately twice the average for 1966–1970. Milk is 70 percent more expensive, and pork 60–75 percent more expensive to produce in 1980 than in the eighth FYP. On the other hand the production cost of poultry has increased modestly.

There was an acceleration of costs during the late 1970's, compared to the early part of the decade, especially on collective farms where the rate of increase of meat products was half again the rate of the ninth five-year plan. On state farms, unit costs for other than poultry products increased by about one fourth in each plan period of the 1970s.

TABLE 4.—AVERAGE RETAIL PRICES AND GOVERNMENT EXPENSE PER TON OF LIVESTOCK PRODUCT IN 1978 (RSFSR)

	Average retail price (R/ton)	Government expense on production-distribution (R/ton)	Expense as percent of retail price
Beef	1,687	3,471	205.7
Pork	1,850	2,391	129.3
Mutton	1,435	3,136	218.5
Whole milk	261	320	122.6
Cream	3,438	5,855	170.5
Soft cheese	2,947	3,609	122.5
Poultry (1977)	1,733	3,211	185.3
Kolbasa (1977)	2,337	3,572	152.8

Source: Structura Rozhichnych Tsen Na Tovary Narodnogo Potrebleniia Za 1978 Gody. (Moscow:TsSU RSFSR, 1979).

TABLE 5.—CHANGES IN UNIT COST OF LIVESTOCK PRODUCTS ON COLLECTIVE AND STATE FARMS, 1966–80

Years	Milk	Beef	Pork	Mutton	Poultry	Wool	Eggs (th)
State farms:							
Rubles per ton:							
1966–70	176	1,179	1,080	688	1,564	3,336	66
1971–75	220	1,572	1,289	909	1,678	4,621	61
1976–80	279	2,044	1,552	1,254	[1] 1,713	6,211	63
1980	308	2,344	1,726	1,357	....	6,983	64
Percent change:							
1971–75/1966–70	25	33	19	32	7	39	−8
1976–80/1971–75	27	30	20	38	[1] 2	34	3
Collective farms:							
Rubles per ton:							
1966–70	168	1,130	1,187	762	1,181	3,656	73
1971–75	199	1,397	1,353	942	1,615	4,734	72
1976–80	254	1,866	1,770	1,253	[1] 1,864	6,391	81
1980	287	2,177	2,018	1,393	....	7,410	87
Percent change:							
1971–75/1966–70	18	24	14	24	37	29	−1
1976–80/1971–75	28	34	31	33	15	35	13

[1] Poultry is for 1976–79.

Sources: Struktura Zatrat i Sebestoimosti Osnovnykh Vidov S-kh. Produktsii v Kolkhozakh i Sovkhozakh MSKh SSSR za 1966–1974 gg. (Moscow: MSKh, 1975); Sebestoimost' produktsii v Kolkhozakh i Sovkhozakh (Moscow: TsSU, USSR, 1975, 1977, 1978, 1979, & 1980); Narodnoe Khoziastvo SSSR v 1980 (Moscow: Statistika, 1981).

It is typical for Soviet agricultural economists to attribute recent increases in costs of all agricultural production (plant and animal) roughly equally to three sources. These are: (1) increases in wages paid farm workers (2) increases in prices of inputs and (3) decreasing productivity due to poor harvests and diminishing returns. Newly available data (the first since that in the Central Statistical Administration's 1971 compilation, Sel'koe khoziaistvo SSSR) reveal the changing structure of livestock production costs and point to some causes of the increase in cost of production of milk, pork and beef in the period 1966–79.

LABOR

Because of mechanization, the direct labor time involved in livestock production is now significantly less than at the beginning of the Brezhnev era (Table 8). The cost to farms of a unit of labor time has risen (e.g. for labor time in milk production, from 0.58 rubles an hour to 0.76 rubles in 1978—see Table 9.) Still the increase in direct labor productivity has almost balanced wage increases, so that the direct labor cost per unit of livestock products (excluding poultry) increased very little in the 1970s, though it accelerated somewhat towards the end of the decade.[11]

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[11] Comparing 1971-74 to the eighth five year plan it could be said that changes in average wage rates on collective and state farms accounted for the following percentages of unit cost increase (i.e., costs increased by these amounts compared to what they would have been had labor productivity increased but wage rates remained the same): Beef—27 percent and 19 percent; pork—42 percent and 14 percent; and, milk—47 percent and 30 percent. Changing average hourly wage rates represent different labor resources as well as changes in wage rate. (E.g., in milk production technicians repair milking machines, replacing milk maids.) See K. Gray, "Soviet Agricultural Specialization Efficiency." Soviet Studies, Vol. 31, No. 4 (October 1979), pp. 542-558.

MECHANIZATION AND FACILITIES

Categories related to increased mechanization—amortization and direct repair costs—also contributed to the increased part of sebestoimost' growth in 1971-1979 not attributable to direct feed costs. These costs have accelerated. Amortization per unit of output increased twice as fast in 1976-1979 as it had in 1971-1975. Social and farm overhead per unit of output increased perhaps five times as fast.

FEED

With declining direct labor costs the largest component in the cost of production of milk (40 percent), beef (54 percent) and pork (56 percent) is now feed. Throughout the 1970s increases in the cost of feed needed to produce a ton of all three products contributed well over 50 percent to the increase in the unit cost of production of all three principle products. However, as Table 6 indicates, during 1976-1979 feed contributed less to the increase in total cost of production than had been the case in 1971-79. Other categories (amortization and general farm overhead) were accounting for more.

Feed cost per ton of product is due to both (1) the cost of a unit of feed, and (2) the amount of feed required to produce a ton of product. With some differences, both of these factors have increased the cost of production of milk, beef, and pork.

TsSU data shows that the aggregate cost of a unit of feed fed to all animals on state and collective farms rose about 25% over the previous five-year plan in 1971-75 and 20% in the four-year period 1975-79, over 1971-75. (This is for an oat equivalent, using Soviet conversion equivalents.) The breakdown of cost increases for feed fed to individual livestock types is also given in Table 6.

TABLE 6.—STRUCTURE AND CHANGES IN COMPONENTS OF COST OF MILK, BEEF, AND PORK PRODUCED ON USSR COLLECTIVE FARMS, 1966–79

Rubles/ton	Milk			Beef			Pork		
	1966–70	1971–75	1975–79	1966–70	1971–75	1975–79	1966–70	1971–75	1975–79
Collective farms:									
Direct labor	65	67	71	301	318	344	271	260	283
Feed	54	74	98	542	726	963	621	743	956
Amortization	8	11	16	49	65	107	56	75	125
Current repair	4	5	7	23	32	43	30	37	48
Other direct	16	21	28	107	144	190	110	139	174
Social and farm overhead	20	21	26	108	113	143	100	98	123
Total	168	199	246	1,130	1,398	1,790	1,187	1,353	1,709
Change in cost/ton over previous FYP (percent):									
Direct labor		2	6		6	8		−4	8
Feed		37	39		34	33		20	29
Amortization		28	51		32	65		35	65
Current repair		35	40		37	37		4	29
Other direct		34	31		35	32		27	25
Social and farm overhead		4	21		5	26		−2	26

Sources: See previous table.

The second factor in feed costs in livestock gain is feeding efficiency, or the rates at which producers can convert into final product a unit of concentrate, or of "all feed" aggregated into total feed equivalents. Feeding efficiency has been a subject of special interest among all analysts who have studied the Soviet feed-livestock complex. The rate of conversion of feed to product depends upon the quality and composition of the feed, the composition of the livestock herd, and the conditions under which feeding is done.

Information contained in Table 6 (cost of feed per unit of product) and Table 7 (cost of unit of feed) indicates the following about USSR feed conversion trends during 1966–79, partly confirmed by data in Table 8 which is for the RSFSR alone:

(1) The overall trend has been to increase the amount of feed available per "standard animal" unit in inventory. (See also Table 3.)

(2) The conversion efficiency of both "all feed" in equivalent units, and concentrates has worsened for milk production, in the 1970s, particularly in the last half of the decade.

(3) The conversion of both concentrates and total feed has worsened for beef raising and fattening, throughout the 1970s.

(4) In swine raising and fattening there may have been little change in feed conversion in the 1970s overall, after some initial improvement in 1971–75 was followed by apparent reversal in 1976–79.

(5) An increase in poultry's share of feed tends in itself to increase overall concentrate feed conversion since poultry converts concentrates at a rate of about 2 to 1 (more efficiently than either cattle or swine.).

TABLE 7.—CHANGES IN COST OF PRODUCTION OF ALL FEED USED TO PRODUCE INDIVIDUAL LIVESTOCK PRODUCTION ON USSR STATE AND COLLECTIVE FARMS, 1966–79

	All feed without pasture						All feed including pasture					
	State farms			Collective farms			State farms			Collective farms		
	1966–70	1971–75	1976–79 [1]	1966–70	1971–75	1976–79	1966–70	1971–75	1976–79	1966–70	1971–75	1976–79
Ruble/ton feed units used producing:												
Milk	69	85	101	48	62	77	55	70	85	39	53	67
Beef	79	92	109	64	75	93	60	76	92	51	64	82
Pork	77	96	121	66	82	102	76	93	120	65	81	101
Mutton	50	62	75	43	54	68	20	28	37	20	28	41
Poultry	124	147	180	63	84	106	123	147	180	62	83	105
All livestock	76	94	114	55	69	825	55	73	93	43	58	74
Percent change in feed cost over previous FYP:												
Milk	....	23	19	....	29	14	....	28	21	....	36	26
Beef	....	16	18	....	17	24	....	27	21	....	25	28
Pork	....	25	26	....	24	24	....	22	29	....	25	25
Mutton	....	24	21	....	26	26	....	40	32	....	40	46
Poultry	....	19	22	....	33	26	....	20	22	....	34	26
All livestock	....	24	21	....	25	20	....	33	27	....	35	28

[1] 1976–79 is simple average of the four years.

Source: Sebestoimost Kormov v Kolkhozakh i Sovkhozakh Moscow: TsSU, 1973–79)

Were better conversion of the constraining element, feed, possible, more production could occur. The evidence is that conversion can be better. Reports of Soviet hog and cattle fattening complexes established since 1965 indicate that cattle on the best complexes (with assured balanced feed and conditions which facilitate rapid gain) can fatten with 30–40 percent less feed than the standard Soviet operation. On advanced swine complexes, 450–630 feed units (oat equivalent) were required per 100 grams of gain, versus the 800–840 required in more common facilities.[12]

The relative success of industrializing pork production (in 1977 about 30 percent of production of pork in the socialist sector occurred in so-called "modern" facilities) is reflected in Tables 6–8 in the relatively good changes in swine feed conversion, compared to trends with cattle. Still, indications are that Soviet swine may use twice as much feed per unit of output than is the case in overall industrialized West European practice.[13]

V. SUBSTITUTIONS FOR BALANCE: PROSPECTS FOR THE 11TH 5-YEAR PLAN

Announced goals for increases in average annual production for 1981-86 over 1976–1980 are 16 percent for meat and poultry, 9 percent for milk, and 14 percent for eggs. The goals for meat and poultry and for milk are larger than the 6 percent for each actually achieved in the tenth five-year plan. But they are much less than the increases achieved in the eighth and ninth plan: 25 percent for meat and 25 percent and 8 percent for milk. The target for average annual increase in egg production in the eleventh plan (14 percent) is less than that actually achieved in 1975–80 (23 percent) which was an overachievement compared to the 16 percent growth originally planned. (See Table 2.)

Even despite the poor results of 1981, given the numbers of animals with which the Soviet Union begins 1982 and with any cooperation of the weather, the Soviet Union should again find significant growth, if not plan fullfillment in this current planning period.

A fundamental problem, however, is reduction of cost. Significant effective farm price increases took effect in 1981, and significant increases in subsidies to maintain unchanged farm input and food retail prices are planned.[14] At the same time, the extent of past cost increases and existing investment and drain from the state budget imply severe pressures for new ideas. Indeed, Soviet livestock economists in 1981 said that whereas for them the watchword in the past had been "output" and in the 1976–80 plan, "quality", in the eleventh five-year plan it is "effectiveness."

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[12] K. Gray, "Performance and Organizational Developments in Soviet Red Meat Production." The ACES Bulletin, Vol. 21, Nos. 3–4 (Fall-Winter 1979), p. 54.

[13] Karl-Eugen Wadekin, "Soviet Agriculture's Dependence on the West." Foreign Affairs. Vol. 60. No. 4 (Spring 1982), p. 886.

[14] In the eleventh five-year plan farm prices have been raised to incorporate an amount equalling the previous premiums for above (annual tverdyi-) plan sales, and a fifty percent premium to price is now paid for deliveries in excess of the average farm sales of 1976–1980. In order to maintain stable retail prices, planned increases in procurement will necessitate a 30 percent increase in state budget donations for this purpose. B. N. Semenov, "Finansy sel'skogo khoziaistva v odinnadtsatoi piatletke." Finansy SSSR January, 1982, p. 25.

Increased real cost is a reflection of diminishing return to overintensiveness and single-minded extension of old plan targets and patterns of growth. Clearly, in the longer run, the road to renewed Soviet progress in consumer satisfaction in the face of resource constraints and increased cost must lie through a myriad of substitutions of technologies, approaches and even products.

Development of the Soviet poultry industry represents just such a development. Other substitution possibilities to restore a more balanced and effective allocation of resources in the livestock sector exist. Some of these seem to be a part of the investment strategy of the new five-year plan. Some approaches require instilling more flexibility to pricing and the administrative apparatus than appears immediately forthcoming.

Gosplan figures for 1981–85 already indicate a greater emphasis on improved pasture, haylands and feed harvesting, and less on facilities for livestock. Whereas in 1976–80 the proportion of investment between feed production and livestock housing was 1 : 2.1 it will be 1 : 1 in the eleventh plan.[15] Alfalfa, a legume with high protein content, is to assume a predominant role in the new feed policy.[16]

Along with grain imports, production of roughage has been the apparent salvation of the livestock sector in recent relatively grain-deprived years and the apparent reason for continued growth of beef production in 1976–80, years in which pork production fell. Direction of more resources to this mode of feeding makes sense for a nation with a comparative advantage in yet underdeveloped pasture and meadows, compared to grain production.

Besides the announced reorientation of investment away from livestock facilities construction, another development indicates change in the approach to feeding. Soviets interviewed in Spring 1981 reported that where capital investment for facilities is made, it will be for remodeling existing facilities, not for new (in the past, often huge) complexes. This change indicates less emphasis on centralized feeding, in order to utilize more fully widely dispersed, often bulky, local sources of fodder. While modern feeding facilities have been successful in reducing cost and increasing feeding efficiency if they get preferential balanced supplies of feed, that has not always been possible for more than select "demonstration" complexes. There have been signs of discontent with results due to feed supply disruption and high cost accompanying the excess capacity of facilities. These signs were developing even before the 1979 grain harvest and the January 1980 American grain embargo.[17]

Despite the persistent complaints of livestock technicians about the imbalance, and thus waste, of rations, the protein content of feed has continued to be low.[18] If the proposed emphasis on legume development does materialize it will contribute to a better balance of rations, improved feeding efficiency and lower cost of feed per unit of output. The small but burgeoning grassmeal industry as part of the growing compound feeds industry must be part of this improvement.[19]

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[15] N. Smetanin, "Sel'skoe khoziaistvo v odinatsatoi piatletke: strategiia i taktika." Ekonomika sel'skogo khoziaistva No. 4, 1981, p. 15.

[16] Ekonomika sel'skogo khoziaistvo, No. 2, 1981.

[17] See, for example, G. Dolgoshei, "Why specialized farms are not working out," Planovoe khoziaistvo, No. 1, 1979, trans. Current Digest of the Soviet Press, March 21, 1979, pp. 16–17, and K. Gray, "Performance and Organizational Developments in Soviet Red Meat Production," ACES Bulletin, Vol. 21 No. 3-4 (Fall-Winter 1979).

[18] See Michael D. Zahn, "Soviet livestock feed in perspective, "Joint Economic Committee of the U.S. Congress, Soviet Economy in a Time of Change (Washington: GPO, 1979), pp. 165–173.

It is clear that part of the problem of inefficient feed conversion also lies in organizational and pricing problems. Interfarm feeding associations formed in the past several years have allowed the development of specialized milling and livestock feeding facilities. At the same time they still face the need to improve internal incentives for members to supply feed and feeder animals. In addition, flexible prices for feed and feeder animals which could be transferred outside and among the jurisdictions of local interfarm organizations do not exist. This fact, plus planning incentives not oriented towards sales of intermediate farm products, plus poor facilities for rural transportation, all inhibit the reallocation of feed to animals, and vice-versa which takes place in market agriculture in response to spatial and temporal imbalances in supply and demand.[20] There is as yet no solution to these problems, although the expanding scope of the mixed feed industry and growing importance of off-farm purchases of feed means new opportunity to effect the redistribution of feed.

TABLE 8.—FEED FED PER UNIT OF LIVESTOCK PRODUCTION IN THE RSFSR ON COLLECTIVE AND STATE FARMS

Year	All feed units (including pasture)				Concentrates (in feed units)			
	Milk	Beef	Pork	Per standard head	Milk	Beef	Pork	Per standard head
1968	1.3	10.60	9.2	25.2	0.3	1.4	7.2	7.4
1969	1.3	10.90	9.1	25.3	.3	2.3	7.4	8.2
1970								
1971	1.37	11.26	8.86	25.34	.35	2.57	7.32	9.06
1972	1.39	11.62	8.85	24.61	.36	2.59	7.41	8.82
1973	1.40	11.27	8.83	25.64	.38	2.57	7.36	9.20
1974	1.42	11.75	8.52	26.94	.39	2.85	7.21	10.01
1975	1.40	11.83	8.35	25.28	.36	2.65	6.91	8.85
1976	1.44	11.73	8.48	25.48	.37	2.75	7.10	8.80
1977	1.47	12.03	8.39	27.61	.43	3.29	7.25	10.56
1978	1.48	12.27	8.62	27.09	.42	3.30	7.44	10.42

Source: Nalichie i Raskhod Kormov V RSFSR (Moscow: TsSU, 1970 & 1979)

In 1972 and 1973 the RSFSR fed somewhat fewer feed units per standard head of livestock than the USSR as a whole and had a somewhat more efficient conversion of feed units to product. (See Nalichie i Raskhod Kormov v SSSR—Moscow, 1974).

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[19] The Soviet compound feed industry, which got its start really only in 1965, achieved annual production of 55.8 mmt in 1976–1980 (up 68% over 1971–75). "USSR: Agricultural Situation Report," FAS UR-2017, February 1982, p. 17.

[20] Gray, ibid.

TABLE 9.—DIRECT LABOR USED IN PRODUCTION OF INDIVIDUAL LIVESTOCK PRODUCTS AND WAGES PAID, 1966–80

	Milk		Beef		Swine	
	Collective	State	Collective	State	Collective	State
Direct labor (man-hours per 100 kilograms):						
1966–70	14	10	71	48	60	30
1971–75	11	9	61	46	44	23
1975–80 [1]	10	8	53	41	37	19
Wage rates (rubles per hour):						
1966–70	0.49	0.58	0.42	0.53	0.46	0.56
1971–74	.60	.71	.52	.66	.52	.66
1976	.68	.83			.66	.81
1977	.73	.89			.70	.85
1978	.76	.90			.72	.85
Percentage changes:						
Direct labor:						
1971–75/1966–70	−21	−10	−14	−4	−27	−23
1975–80/1971–75	−9	−13	−13	−11	−16	−17
Wages:						
1971–74/1966–70	22	22	24	25	12	18
1976–78 [1]/1971–74	21	23			33	27

[1] Simple average.

Sources: Narodnoe Khoziastvo SSSR v 1980, Struktura Zatrat (Moscow, 1975), Sebestoimost' Produktsii (Moscow, 1978 and 1979).

Pricing and incentive structures also contribute to poor performance in breeding thrifty, high-yielding animals. This is true both for beef-milk cattle crosses which could be bred for more hybrid vigor in fattening, and for basic breeding stock.[21] Interoblast transfers of better animals, from oblasts which have them to others which need them, have recently declined, reportedly because of pricing inflexibilities and planning disincentives.[22]

Some new flexibility is in place for livestock currently in regard to private farming. The private plot sector has been producing a relatively constant absolute amount but declining share (currently about 30 percent of value) of all livestock production. A new program which began wide employment in certain oblasts several years ago has received official sanction with the latest decree governing private agriculture in Spring 1981. Under this decree the maximum number of livestock which private operators can maintain has been raised. The program involves private persons receiving young animals under contract from collective farms to raise them with materials assistance from farms before returning them to the farms. Early experience, described by commentator G. Lisichkin, show these arrangements could produce less expensive results in terms of both feed conversion and housing, because of expensive constraints imposed upon the Socialist farms and private incentive and ability to utilize small-scale otherwise unused resources.[23]

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[21] Gray, ibid, pp. 60–61.

[22] Iuriev, Pravda, December 9, 1981, p. 2; trans. CDSP, Vol. 33, No. 49, 1981, p. 22.

[23] Gerardy Lisichkin, "Bol'shie vozmozhnosti," Literaturnaia gazeta, December 17, 1980.

One new direction of Soviet investment in the new plan seems to be increased plan emphasis on infrastructure.[24] There is to be a 40% increase in construction of interfarm hard-surfaced roads.[25] Eleventh five-year plan expenditures for the storage of grain, vegetables, feed, and for refrigerators is to be 15 billion rubles, up 60 percent over 1976–1980.[26]

These expenditures will increase production, but also potential utilization of production. Rural road improvement can reduce crop losses through more timely field operations and distribution of intermediate products. Storage of feed can alleviate intertemporal imbalance and waste associated with Soviet climatic vagaries.

Growing Soviet conceptualization of a "Food Complex" also shifts attention away from production, more to utilization of production for the purposes of final consumption (the Russian, konechnyi produkt). The opportunities for greater pay-off for investment in the "third sphere" (storage, transportation, processing and distribution) of the national agroindustrial complex are obvious in cross-national comparisons of utilization, and in observation of the Soviet final products.[27] This is true for all products It is observable with regard to milk in leaking cartons and product spoiled by lack of refrigeration at the retail level, despite advances made during the tenth plan in farm refrigeration and procurement standards and methods. One cross-national indicator of the room for improvement is the observation that the Soviet Union feeds well over 11 percent of its milk to animals, versus 4.5 percent for Western Europe. As a major dairying nation it is amazing that only 6–7 percent of milk production is utilized for making cheese, versus 22 percent for Western Europe.[28]

Annual averages for consumption of Soviet livestock products (as well as many other consumer products, especially fruits and vegetables) belie the actual welfare derived from them. A "quality discount" should perhaps be applied as much for reasons of sporadic availability, as for the physical quality of what is available.

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[24] Although the category infrastruktura occupies only a bare inch in the Central Agricultural Library's huge thematic catalogue, the word seems to occupy an increased importance, at least in Moscow economics research institutes in 1981. A new Soviet book written at the central Committee's Social Science Academy was known by all Moscow economic analysts in 1981, and the word was on their lips. (I. F. Cherniavsky. Infrastruktura sel'skokhoziaistvennogo proizvodstva (Moscow: Ekonomika, 1979).

[25] L. Brezhnev, Pravda, November 17, 1981. In his speech to the CC CPSU.

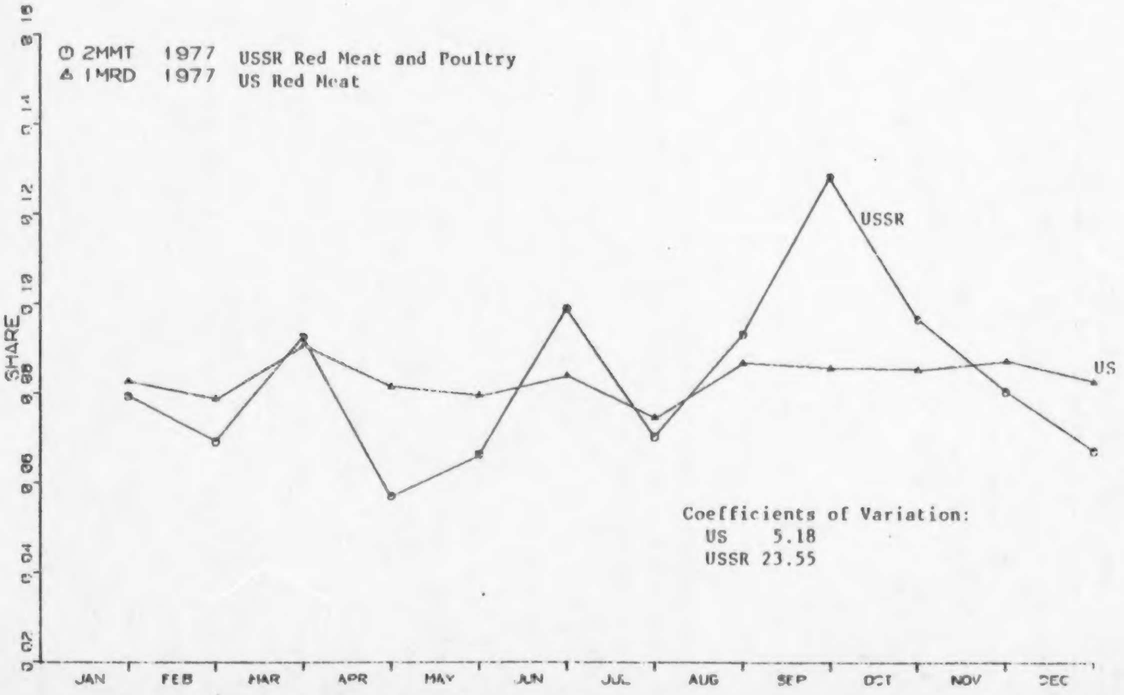
[26] M. Gorsmikov, "Razvite proizvodstva tovarov shiokogo potrebleniia-vashneishee uslovie rosta narodnogo vlagosostoianiia", Planovoe khoziaistvo No. 5, 1981, pp. 34–39.

[27] For instance, a widely-cited statistic published by V. Tikhonov holds that while the USSR produces 6.5 times as much potatoes as does the U.S., only one-half this is sold off the farm and of that, the amount that becomes commercial retail sales is slightly less than the American level of retail sales. (V.A. Tikhonov, "Osnovnoye napravleniia sotsial'no-eknomicheskogo razvitiia SSSR." Voprosy ekonomika, No. 1, 1981, p. 89. (There is also an approximately equivalent amount of home production and private uncounted sales. Moscow residents then claim that of that which is purchased about ¼ will be thrown out at home because it is of such poor quality.

[28] United Nations Economic Commission for Europe. "Prospects of the Markets in the ECE Region for meat, Milk and Dairy Products and Feedstuffs until 1985." October 26, 1978, p. 23.

Figure 3

Distribution of Shares of Monthly Total Meat Production for the US and USSR, 1977



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Livestock products in particular will often not be available for long periods of time and then are available in spurts, accompanied by waste and effectively diminished consumer aggregate utility. Storage and transportation investments can improve this, but the problem relates also to pricing and the management system.

Retail prices, which could balance supply and demand, are not seasonally variable (as they are somewhat for fruits and vegetables) except in the collective farm markets.[29]

Also, procurement deliveries by farms and production are highly seasonal. Figure 3 illustrates the degree to which deliveries by state and collective farms of meat are distributed unevenly through the year, while at the same time U.S. meat production is relatively smooth.[30] These variations are translated into retail supply variation, but "bunched deliveries" also cause capacity utilization problems and increase costs for the packing industry. Uneven loads also require the utilization of older plants which render livestock less completely into usable products.[31]

A much smoother pattern of American meat production and retail provision is helped by seasonally flexible farm prices which coax sales into what would otherwise be off-season periods. Some Soviet livestock experts lament the fact that (unlike the situation for vegetables) the Soviet Union now has uniform year-round prices for both livestock products and feeder animals.[32] While steps to restore some seasonable flexibility, which existed prior to 1970 farm price alterations, are not imminent, they may someday occur.

Improved processing, storage, and distribution constitute intelligent substitutions to achieve more efficient improvement of final consumer satisfaction. It is also quite possible, in light of the levels of animal products consumption that the Soviets have already achieved (meat consumption, after all, within 10 percent of that of Sweden, one of the richest nations of the world) that both Soviet planners (and American authorities contemplating feed grain embargoes) now pay relatively too much attention to the meat problem. In the Soviet Union, where the state endures large subsidies for livestock products, private farming has in many areas switched almost entirely out of livestock into more remunerative production of fruits and vegetables.[33]

Increased retail prices for livestock products would help reduce the length and frequency of lines. But even without price increases to foster consumption substitutes and shorten lines, and perhaps as important as the investment strategy for the Soviet food complex, are developments in the rest of the consumer sector. Citizens who now spend an average of over 30 percent of their disposable income on food may desire less food if other products are available. In a wide discussion of substitution possibilities it is well worth noting the 40 percent increase in production of household and cultural goods planned for the eleventh five-year plan.

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[29] An exception was observed by this author in Moscow in 1976 when eggs were in short supply in state stores, but appeared as a higher priced "dietetic" variety of presumably unchanged quality.

[30] Using monthly data from USDA's Livestock and Meat Production, for years 1970-78, the coefficient for monthly meat production ranges as follows: Beef 4.29—9.05; Veal 5.06—29.96; Pork 6.89—12.46; All red meat 4.33—7.78. Using available monthly data from Ekonomicheskaia gazeta, for 1975, 1977 and 1978 coefficients of variation were a great deal more: Beef (including veal): 22.23—25.16; Pork: 16.73—33.87; mutton 85.08—88.67; Poultry: 20.14—21.97; All meat and poultry: 22.64—23.55. See also L. B. Dekel'man, et. al. "Metody izucheniia sezonnosti proizvodstva," Miasnaia industriia, No. 1, 1978, pp. 5-9.

[31] Snitser, 1979, p. 88.

[32] V. A. Dobrynin, Tsenoobrazovanie i tseny na produkty sel'skogo khoziaistva (Moscow: Tipografiia TSKha, 1975), 47.; S. I. Kutikov, Economicheskaia effektivnost' metodov intensifikatsii zhivotnovodstva. (Kiev: Urozhai, 1971), p. 128.

[33] A. Labiak, "V ch'ikh rukakh skota? Pravda, February 4, 1980, p. 7.

CLIMATE AND GRAIN PRODUCTION IN THE SOVIET UNION

By Russell A. Ambroziak and David W. Carey*

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I. SUMMARY

The past few years have been difficult for Soviet agriculture and for the Soviet economy as a whole. Three consecutive crop failures during 1979-81 have necessitated the import of more than 100 million tons of grain and some 2½ million tons of meat since June 1979, at a cost of roughly $18 billion. These imports notwithstanding, food shortages have been common, and the much-heralded campaign to improve the diet of the Soviet consumer has suffered yet another setback.

Poor performance in 1979 and 1980 ensured that the Tenth Five-Year Plan output goals for agricultural products were not met. The 1981 harvest disaster suggests further that many of the agricultural production goals of the Eleventh Five-Year Plan are already out of reach. Plans for both periods called for a slowdown in the rate of growth of inputs to agriculture, in keeping with an economy-wide slackening in the rate of investment. Planners instead put greater reliance on productivity gains to achieve output targets. Many observers have long held that such faith was inappropriate given agriculture's continued vulnerability to poor weather and the frequency with which such weather occurs.

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Nowhere is the impact of weather more easily seen than in the grain production record—a barometer of Soviet agricultural fortunes and misfortunes. Soviet planners must solve the grain production puzzle in order to guarantee the development of the livestock sector needed to put more meat on Soviet tables. Grain production has grown markedly during most of the Brezhnev era. Output averaged only some 130 million tons during 1961–65 but averaged 205 million tons during 1976–80. An examination of weather data for the past two decades suggests that roughly two-thirds of the increase in grain productivity during that period was the result of improved climate and only one-third came from technology or increased inputs. Much of the increase in yields came during the mid-1960s to mid-1970s, the result of consistently and increasingly favorable climate in the Soviet grain region. A series of good crops during those years undoubtedly fostered the euphoria among Soviet planners that gave birth to the unrealistic crop expectations in the Tenth and Eleventh Five Year Plans.

Despite impressive gains, grain production has failed to meet Soviet plans, which if anything understate the demand for grain. Consideration of the weather probable during the next few years indicates that this will be the case for 1981–85 as well. Estimates of the margin of shortfall depend on assumptions regarding weather during the period and the Soviet ability to upgrade technology. Under the most likely set of assumptions, average grain production for the period will fall far short of demand, even though year-to-year fluctuation in the weather will likely produce both crop failures and bumper crops. As a result, the USSR will have to rely on massive amounts of foreign grain or expect further disappointments in the food program.

II. INTRODUCTION

Agriculture is a chronic problem for Soviet leaders. Massive investment in the agricultural sector during the Brezhnev years has resulted in increased production, but production levels still are insufficient to satisfy demand.[1] The primary focus is on grain and meat. Efforts to upgrade consumer diets by providing more meat have boosted the requirement for grain well beyond the amount that Soviet farmers have been able to reliably supply. Year-to-year fluctuations in grain production compound the problem. When poor years occur consecutively, as during 1979–81, the effects are especially severe. Even with record imports of grain and meat, unusually severe shortages are reported, and consumers find themselves little better off in terms of per capita supplies than when the Brezhnev program began.

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[1] Because Moscow persists in an official policy of maintaining retail prices for commodities such as meat at relatively low levels in state retail outlets, the demand for meat is higher than it would be under a pricing scheme that more realistically reflected the cost of production. Under the current arrangement, of course, a portion of the rising costs of production are subsidized via the state budget.

In many respects, the fortunes of Soviet agriculture can be measured by grain production. This paper briefly describes the physical environment in which grain is grown in the USSR, recaps performance during the Brezhnev years both in terms of the amount of inputs funneled to agriculture and the amount of grain produced, examines the role of climate and technology in increasing grain production during that period, and assesses prospects for grain production during the Eleventh Five-Year Plan, 1981-85.[2]

III. Grain Production in the USSR

A. THE SETTING

Environmental conditions in the USSR in general do not favor agriculture. Grain is grown principally in a zone that extends some 2,800 nautical miles east to west and more than 1,000 nautical miles north to south. This zone falls roughly between 45° N and 60° N. latitude. In North America those parallels define an area that stretches from the Dakotas to Hudson's Bay. The growing season in that part of the Soviet Union is short with late frosts and early snows common. Those areas with sufficient warmth generally suffer from moisture deficiency, and year-to-year variability in weather conditions plays havoc with Soviet efforts to maintain steady growth in grain production.[3]

Climate in the USSR grain region is essentially dictated by the stationary weather systems that form over Siberia and the North Atlantic Ocean.[4] Generally, a high pressure system over Siberia and a low pressure system over the North Atlantic dominate during the winter, causing the wind to flow from the southwest. This air, which originates in north Africa and southeastern Europe, is relatively dry. Storms bringing moisture from the North Atlantic must overcome this gentle push to the north, which makes it difficult for precipitation to get into the southeastern portion of the grain region. The pressure pattern is just the opposite in summer, with a siberian low and a North Atlantic high bringing air from the northwest. Because almost all of the precipitation in the grain regions comes from the North Atlantic, summer is the season of maximum rainfall for most regions. This air dries out as it moves east and south, dropping less and less precipitation as it goes. As a result, much of the Soviet grain area typically has a moist-continental climate type. In those areas where evaporation potential exceeds precipitation the normal climate is a steppe; if evaporation exceeds precipitaiton by a large margin, the steppe becomes a desert. Generally, excluding irrigation, grain grows reasonably well in a moist-continental climate, with difficulty in a steppe, and not at all in a desert.[5]

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[2] The authors wish to thank R. L. Patrick Johnson, Sharon Rouse, and Cynthia Wood for their assistance in the preparation of this paper.

[3] For a more complete description of the environmental setting for agriculture in the USSR see USSR Agriculture Atlas, Central Intelligence Agency, December 1974.

[4] Climate is weather on a longer time scale. Disagreement over the definition of climate has frequently been over the length of time—ranging from 10 to more than 30 years—necessary to establish norms. In this paper climate is simply weather averaged for a year or more. This definition makes no assumption about the stability of climate.

[5] "USSR: The Impact of Recent Climate Change on Grain Production," Central Intelligence Agency, ER 76-10577, October 1976, p. 5.

The harvested grain area in the USSR varies somewhat from year to year but generally amounts to between 125 million hectares and 130 million hectares.[6] Roughly one-third of the yearly grain crop—and about one-quarter of the harvested area—is comprised of winter grains, sown in the fall and harvested the following summer. Spring grains, sown April to June and harvested during the late summer and early fall, account for the remainder. Winter grains are grown primarily in the European USSR west of the Ural mountains. Winter wheat is grown in the southern part of this region with the hardier winter rye grown in areas that lie to the north. Spring grains are grown to some extent almost everywhere, but the principal spring grain areas are in the Volga valley, where winter and spring grains are almost evenly mixed, and in the regions east of the Ural mountains. Much of the country's spring wheat is grown in the republic of Kazakhstan and adjoining areas of the Russian republic (RSFSR). Within the last decade, spring wheat has been replaced in many areas with spring barley, a crop generally more resistant to drought, in an attempt to both grow more feedgrains to support the livestock industry and to dampen the year-to-year variation in grain production.

Nonetheless, the grain crop is vulnerable to extreme weather conditions throughout much of the year:

> In the fall, inadequate soil moisture, especially in the North Caucasus and the southern Ukraine, often interferes with the germination of winter grains. Before the onset of winter, gradually cooler weather is needed to properly harden the winter grains. Even so, because of insufficient snowcover to insulate the crop, some 15 to 20 percent of the area sown is killed during the winter each year by low temperatures.
>
> In early summer, intermittent periods of hot, dry weather can severely affect grain plants. It is at this time that a sukhovey—a hot, dry wind—is most common. A sukhovey can desiccate winter and spring grains alike. Plant sterilization or the loss of potential tillers or secondary stalks is often the result; in either case, yields can suffer drastically.
>
> During the summer, drought conditions often become widespread. In some years, conditions in many areas are severe enough to kill grain plants. In other years, depending on the stage of crop growth when the hot weather occurs, plants may develop too rapidly to allow grain heads to fill adequately, also markedly reducing final yields.
>
> At the end of the crop season, especially in the eastern areas, early frosts often stop plant growth before plants have fully matured, thereby lowering production.

---

[6] Since 1960, the grain area "harvested" has been as large as 133.3 million hectares and as small as 114.5 million hectares. During 1976–81 the harvested area on average was 127.5 million hectares. Data are from "Narodnoye khozyaystvo S.S.S.R. v. . . . godu," selected years. As used here, the term harvested differs somewhat than the definition used in Western countries. The harvested area in this context is an aggregation of the area sown to winter grains less the area lost because of winter damage or used for spring forage plus the area sown to spring grains. In some years, evidence suggests that the area of spring grains abandoned is considerable, consequently overstating the harvested area.

And at harvest, rain and often snow can disrupt activity. In some cases fields are not harvested at the optimum time, leading to a loss of quality. In other cases, snow necessitates some fields be abandoned altogether.

B. THE RECORD

Considering the odds, the Soviets have compiled a noteworthy record (Table 1). During 1961-80, net agricultural production—and grain output—grew at an average annual rate of about 2.0 percent.[7] The grain production record by five-year plan periods presents a picture of sustained growth. Production averaged 130.3 million tons during 1961-65, 167.6 million tons during 1966-70, 181.5 million tons during 1971-75, and 205.0 million tons in 1976-80.[8] Such statistics are somewhat misleading, however. After a period of steady growth in the late 1960s and a period of relatively stable production during the early 1970s, yearly grain production has fluctuated widely since the mid-1970s.[9] For example, a drought in 1975 cut grain output to 140.1 million tons. In 1978, favorable weather yielded a record crop of 237.4 million tons. But grain production since 1978 has averaged only some 175 million tons per year. Moreover, for the most part, production of grain—as well as the other major crops except cotton—has consistently fallen short of plan, and more importantly, not enough grain has been produced to satisfy the demand for grain created by the regime's efforts to boost meat production.

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[7] Net agricultural production is the estimated value of agricultural output available for sales and home consumption, using 1970 prices; that is the value of total production minus farm products used for seed and livestock feed, minus eggs used for hatching, and adjusted for changes in inventories of livestock. For a detailed discussion of the methodology used to measure net agricultural production see Barbara Severin and Margaret Huglas, "An Index of Agricultural Production in the USSR." US Congress, Joint Economic Committee, USSR: Measures of Economic Growth and Development, 1950-80, U.S. Government Printing Office, Washington, D.C. 1982. For a more complete discussion of performance during the Ninth and Tenth Five-Year Plans see David W. Carey, "Soviet Agriculture: Recent Performance and Future Plans," US Congress, Joint Economic Committee, Soviet Economy in a New Perspective, US Government Printing Office, Washington, D.C., 1976 and David W. Carey and Joseph F. Havelka, "Soviet Agriculture: Progress and Problems," US Congress, Joint Economic Committee, Soviet Economy in a Time of Change, Volume 2, US Government Printing Office, Washington, D.C., 1979.

[8] Official Soviet data for grain production are used in this paper. Data include production of wheat, rye, barley, corn, oats, millet, buckwheat, rice, and pulses. Figures reported are in "bunker weight" which includes excess moisture, unripe and damaged kernels, weed seeds, and other extraneous materials and have not been adjusted to reflect post-harvest losses incurred in handling and storage. An official Soviet announcement of 1981 grain production was not made prior to the preparation of this paper; 1981 production is assumed to be 160 million tons.

[9] Variations in crop production can be measured by the adjusted annual deviation (AAD) computed to indicate the standard deviation of percentage changes of year-to-year production not accounted for by a constant growth rate using the following formula:

$$\mathrm{AAD} = \left[\sum_{i}^{n-1}\left(\{P_i - P_j\} / P_j\right)^2 / (n-1)\right]^{1/2} - (r^2)^{1/2}$$

Where: P = production, i = year, $j = i - 1$, n = number of years of data, and

r = growth rate from year 1 to $n = (P_n/P_1)^{(1/(n-1))} - 1.0$

The AAD for grain production in the USSR during 1962-80 was 21 percent. The AAD for grain production in the United States during 1962-80 was 6 percent.

TABLE 1.—USSR: AVERAGE ANNUAL PLANNED AND ACTUAL PRODUCTION OF MAJOR CROPS AND ANIMAL PRODUCTS

	1961–65	1966–70		1971–75		1976–80		1981–85
	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan
Rate of growth (percent):								
Total value of farm output[1]	3.6	[2] 5.3	3.9	[2] 4.4	−0.2	[2] 5.5	1.0	[2] 4.9
Crops[3]	2.4	NA	5.2	NA	−1.6	NA	1.4	NA
Animal products[4]	4.6	NA	2.7	NA	1.1	NA	0.7	NA
Production of major farm commodities (million metric tons):								
Grain	130.3	167.0	[7] 167.6	195.0	181.5	215–220.0	205.0	239.0
Potatoes	81.6	100.0	94.8	106.0	89.8	[6] 102.0	82.6	89.1
Sugar beets	59.2	80.0	[7] 81.1	[5] 87.0	75.9	95–98.0	88.4	100.0
Sunflower seeds	5.1	NA	6.4	[5] 6.8	6.0	[6] 7.6	5.3	6.7
Vegetables	16.9	NA	19.5	24.7	22.9	[6] 28.1	26.0	29.3
Cotton	5.0	5.6–6.0	[7] 6.1	6.8	[7] 7.7	[5] 8.5	[7] 8.9	9.2
Meat	9.3	11.0	[7] 11.6	14.3	14.0	15–15.6	14.8	17.1
Milk	64.7	78.0	[7] 80.6	92.3	87.4	94–96.0	92.6	98.1
Wool (thousand metric tons)	362.0	NA	398.0	464.0	442.1	[6] 473.0	456.5	474.0
Eggs (billion)	28.7	34.0	[7] 35.8	46.7	[7] 51.4	58–61.0	[7] 63.1	72.1

[1] Agricultural output for sales and home consumption minus farm products used for seed and livestock feed. Price weights for 1970 have been used in aggregating the physical output of crops and animal products (including changes in inventories of livestock).

[2] Plan for growth of gross volume of agricultural output.

[3] Value of output of food and technical crops less seed but including the portion fed to livestock.

[4] Value of output of meat, milk, eggs, wool, and other livestock feed and adjusted for changes in herd inventories.

[5] Calculated using the implied average annual rate of growth derived from production data in the base year and planned output in terminal years.

[6] N. Gusev "Glavnaya vadacha sel'skogo khozyaystva v desyatoy pyatiletke," "Ekonomika sel'skogo khozyaystva," No. 8, 1976, pp. 14–26.

[7] Indicates Plan fulfillment.

NA = Not available.

Sources: Production statistics from "Narodnoye khozyaystvo S.S.S.R. v. . . . godu," selected years and yearly plan fulfillment reports. Plan data for 1966–70 are from "Pravda," April 1966, p. 4, for 1971–75 from "Gosudarstvennyy pyatiletniy plan razvitiya narodnogo khozyaystva S.S.S.R. na 1971–75 gody," pp. 167, 169–170, for 1967–80 from "Pravda," March 7, 1976, pp. 2–8, and for 1981–85 from "Ekonomika sel'skozo khozyaystva," No. 12, December, 1981, pp. 3–10.

IV. WEATHER AND TECHNOLOGY

The Brezhnev regime has devoted considerable resources to agriculture since the mid-1960s in order to reduce yearly fluctuations in grain output while increasing production. The grain production record reflects this commitment but also reflects a favorable shift in the climate during the late 1960s and early 1970s.

A. AGRICULTURAL INPUTS

Year-to-year variability in agricultural production is a problem long recognized by the Soviet leadership. The Brezhnev regime's program for growth, stability, and efficiency has been centered on land reclamation and deliveries to agriculture of mineral fertilizer, other soil additives, farm machinery, and equipment. Just as with the production targets, goals for land improvement and for the delivery of industrially-produced materials to agriculture generally have not been met (Tables 2 and 3). Even so, massive amounts of resources have been channeled to agriculture. These efforts were designed to create so-called zones of guaranteed agricultural production. Such zones still do not exist, and the yearly increase in the flow of material to agriculture has slackened. Plans for the Eleventh Five-Year Plan indicate that for the most part—trucks being the major exception—yearly deliveries of goods to agriculture will not only fail to grow at past rates but will also, in most cases, suffer an absolute decline. This slowdown does not reflect a lower priority for agriculture but rather a general tightening of investment funds throughout the economy.[10]

TABLE 2.—USSR: AVERAGE ANNUAL DELIVERIES OF MACHINERY AND EQUIPMENT, PLANNED AND ACTUAL [1]

	1966–70		1971–75		1976–80		1981–85
	Plan	Actual	Plan	Actual	Plan	Actual	Plan
Deliveries to agriculture of:							
Tractors:							
Thousand units	358	293	340	333	380	364	374
Rate of growth	[2] 13.7	[2] 5.2	[2] 3.2	3.7	[2] −0.9	−1.3	[2] 0.3
Trucks:							
Thousand units	220	143	220.0	220	270	268	292.2
Rate of growth	[2] 29.7	10.7	[2] 11.6	11.5	[2] −0.1	−0.1	[2] 2.7
Agricultural Machinery:[3]							
Billion rubles	2.2	1.8	3.1	3.1	[4] 4.6	4.2	6.2
Rate of growth	[2] 11.3	7.2	[2] 12.9	12.4	[2] 6.7	4.2	9.9
of which, combines:							
Thousand units	110	94	109	90	108	108	120
Rate of growth	[2] 11.1	4.1	[2] 3.8	−1.1	[2] 5.4	5.0	[2] 9.0

[1] Rates of growth computed from unrounded data.

[2] Constant rates of growth derived from actual deliveries in the base year and planned total deliveries for the succeeding five-year period.

[3] Production of agricultural machinery is given for 1976–80 and for 1981–85 plan; other data have been adjusted to reflect actual deliveries to agriculture. All data have been converted to 1967 prices.

[4] N. P. Gusev and G. S. Gaponenko, editors, "Osnovnye nopraveniya rosvityz sel'skogo khozyaystva v desyatoy pyatiletke," Moscow, 1976, page 38. As cited, the plan allocated 23 billion rubles of agricultural machinery to agricultrual during 1976–80.

Sources: "Narodnoye khozyaystvo S.S.S.R. v. . . . godu," selected years and yearly plan fulfillment reports generally published in "Pravda." Plan data for 1981–85 from "Pravda," July 4 and July 11, 1978 and from "Finansy S.S.S.R.," No. 1, January 1982, pp. 17–25.

TABLE 3.—USSR: AVERAGE ANNUAL EFFORTS ANNUAL EFFORTS TO IMPROVE CROPLAND, PLANNED AND ACTUAL [1]

	1966–70		1971–75		1976–80		1981–85
	Plan	Actual	Plan	Actual	Plan	Actual	Plan
Mineral fertilizer, delivers to agriculture:[2]							
Million tons, standard units	41.4	37.0	60.6	61.3	93.4	80.5	[4] 105
Percent increase	15.2	11.0	10.4	10.6	9.7	2.3	[3] 7.2
Area limed:							
Million hectares	6.0	4.5	6.4	5.7	9.4	NA	NA
Percent increase	[3] 25.5	11.7	[4] 8.4	5.3	[4] 13.7	NA	NA
Gross addition of irrigated land:							
Thousands hectares	550.0	360.0	800.0	907.8	980.0	763.6	720
Percent increase	[3] 11.3	−0.4	25.4	25.0	[4] −6.1	10.6	[4] −10.3
Gross addition of drained land:							
Thousand hectares	1,250.0	782.0	1,000.0	882.0	940.0	729.2	760
Percent increase	[3] 19.6	2.9	[4] 6.9	4.5	−2.6	−7.9	[4] −9.6

[1] Rates of growth calculated from unrounded data.

[2] Includes feed additives.

[3] Calculated from Plan data for the terminal year of the period cited and actual performance in the base year.

[4] Constant rates of growth derived from actual performance in the base year and planned total performance for the succeeding five-year period.

NA=Not available.

Source: "Narodnoye khozyaystvo S.S.S.R. v. . . . .godu," selected years and yearly plan fulfillment reports generally published in "Pravada." Plan data for 1985 from "Finansy S.S.S.R," No. 1, January 1982, pp. 17–25.

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[10] For a more detailed discussion of input plans and performance see David W. Carey and Joseph F. Havelka, op. cit.

B. THE WEATHER

Agriculture during the Brezhnev period has gained not only from an increased flow of investment resources but also from a favorable shift in the climate. During 1962–80, yields of both winter and spring grains increased markedly (Table 4). Indeed when applied to a standard area for this period, improved yields boosted grain production by some 4.4 million tons yearly.[11] Efforts to separate the impact of climate on grain yields from the impact of other inputs, hereafter collectively called technology, suggest that two-thirds of this yearly increase was the result of better climate; technology accounted for the remainder. Moreover, climate and technology played significantly different roles in winter grain performance and spring grain performance. With regard to the winter grains, climate accounted for one-third of the yearly increase in yields with technology accounting for two-thirds. This strong technology effect was not evident in spring grains yields; 90 percent of the increase in yields came from better climate.[12]

TABLE 4.—USSR: GRAIN YIELDS, 1962–80

Year	All grain yields		Winter grain [1] yields		Spring grain [2] yields	
	Tons per hectare	Index [3]	Tons per hectare	Index [3]	Tons per hectare	Index [3]
1962	1.09	80	1.32	80	0.99	77
1963	.83	61	1.08	66	.74	58
1964	1.14	83	1.12	68	1.15	90
1965	.95	69	1.34	82	.78	61
Annual average, 1962–65	1.00	73	1.22	74	.92	72
1966	1.37	100	1.60	98	1.28	100
1967	1.21	88	1.50	91	1.10	86
1968	1.40	102	1.57	96	1.33	104
1969	1.32	96	1.60	98	1.26	98
1970	1.56	114	1.93	118	1.45	113
Annual average, 1966–70	1.37	100	1.64	100	1.28	100
1971	1.54	112	2.00	122	1.37	107
1972	1.40	102	1.66	101	1.33	104
1973	1.76	128	2.36	144	1.58	123
1974	1.54	112	2.09	127	1.36	106
1975	1.09	80	1.67	102	.93	73
Annual average, 1971–75	1.47	107	1.54	94	1.31	102
1976	1.75	128	2.22	135	1.62	127
1977	1.50	109	2.20	134	1.30	102
1978	1.83	134	2.66	162	1.57	123
1979	1.42	104	1.91	116	1.27	99
1980	1.49	109	1.93	118	1.34	105
Annual average, 1976–80	1.60	117	2.18	133	1.42	111

[1] Winter wheat, rye and winter barley.

[2] Spring wheat, spring barley, corn, oats, millet, buckwheat, rice, and pulses.

[3] Index: average annual 1966–70=100.

Source: Grain yields from "Narodnoye khozyaystvo S.S.S.R. v. ....godu," selected years.

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[11] The grain area used for this exercise was arbitrarily chosen as 130 million hectares (30 million hectares of winter grains and 100 million hectares of spring grains).

[12] The methodology used to differentiate weather effects from technology effects is based on the approach used in "USSR: The Impact of Recent Climate Change on Grain Production," op. cit. and is described in the Appendix to this paper. The period examined in this paper, 1962–80, was determined on the one hand by available data (data for earlier years are incomplete) and on the other hand by the authors' desire to prepare forecasts for the 1981–85 period without bias from performance in 1981.

Progress during this period was not constant, as noted earlier, and reflected significant changes in climate in the grain producing regions of the USSR. During the early 1960s, the climate that predominated in these regions was closely akin to the long-term climatic norms, reflecting a continental rather than maritme regime. A significant fluctuation occurred in the climate during the mid-1960s to the mid-1970s, however. A shift in wind patterns brought an increased flow of maritime air from the North Atlantic, which increased precipitation. Average annual precipitation in the Soviet grain region was about 10 percent above the long-term average prior to 1960. Moreover, the shift resulted in warmer winters and cooler summers, conditions which generally favor grain production.

This change in climate was neither smooth nor steady during this period, and its effect varied by region. Winter and spring grains were affected differently by the change, not only because of their different geographical locations but also because the timing of their growth stages requires different conditions for optimum development. The regions that gained most from the climate shift were the steppe regions of the RSFSR, the Ukraine, and Kazakhstan. Changes due to climate in the wetter regions of the Soviet Union were negligible, but there as a pronounced beneficial change in the spring wheat areas and yields improved.

Another phenomenon was at work during this period. During the early 1960s, the drier regions of the USSR—principally the spring grain growing regions—experienced a drought, and usually a crop failure, every other year. In the alternate years, precipitation would increase dramatically, and a good grain crop would result.[13] During the mid-1960s to mid-1970s not only did the average amount of precipitation increase in the spring grain areas but also the year to year variability in precipitation showed a marked reduction. Such quiet periods (when the dry year followed by a wet year phenomenon is less noticeable) have occurred in the Soviet Union roughly every 12 years. The effect can be seen in spring wheat yields. During 1962 to 1966, yields doubled and halved in alternate years. Such year-to-year changes dampened in the late 1960s and from 1970 to 1973 were on the order of 10 percent.

Yearly variations in weather became more pronounced again during the late 1970s, but the average precipitation level remained high. In terms of grain production, the following occurred:

> Spring grain output varied directly with precipitation.
>
> So did winter grain output, but the year-to-year swings were even greater because of the strong influence of tech-

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[13] Soviet meteorologists, climatologists, and agronomists have discussed this so-called quasi-biennial phenomenon (see especially P. I. Koloskhov, "The Climatic Factor in Agriculture and Agroclimatic Zoning," Moscow, 1971). The phenomenon is persistent but is not truly biennial. It is very pronounced for a period of years, then it may not be evident for several years. In the grain regions of the Soviet Union, these quiet periods when the phenomenon is less evident occur roughly every 12 years. This does not mean that weather repeats itself every 12 years, thus the use of this cycle as a forecasting tool for seasonal weather is risky. Rather it shows that the wide fluctuations of the 1960s and the stable weather of the early 1970s is a normal occurrence. What is unusual is that the stable period occurred at a high precipitation level. See "USSR: The Impact of Recent Climate Change on Grain Production," op. cit., p. 17.

nology. When weather was poor, that alone was sufficient to constrain production; technology had little effect. When weather was favorable, available technology became the principal factor controlling—often limiting—production.

In those years when weather was poor in both the winter grain and spring grain areas—1975 especially—a crop failure resulted.

In those years when good weather in one region offset bad weather in another, average to mediocre crops were the result.

And in those years when weather was favorable in both areas—1976 and 1978—record crops were produced. Production could have been greater—especially in the winter grains area—in those years when weather was favorable but for the failure by the Soviets to maintain growth in the delivery of key inputs such as fertilizer.

V. Grain Production Prospects, 1981-85

The Soviets will not be able to solve their grain production problems in the next several years. Although plans call for average grain production of 239 million tons during 1981-85 and a crop of 245 million tons in 1985, the leadership must surely know such goals are unattainable. With a 160-million-ton crop in 1981, production in 1982-85 would have to average almost 260 million tons to reach the Five-Year Plan target; the record crop was 237 million tons in 1978, and the Soviets have managed only three harvests greater than 220 million tons.[14]

A more realistic view of grain production prospects for 1981-85 depends on the assumptions made regarding the climate likely during that period:

"Average climate"—if the average climate observed during 1962-80 holds for the next several years, conditions in both the winter grain and spring grain areas would be only somewhat cooler and wetter than the norm that prevailed prior to 1960. Under such conditions production increases would be primarily the result of increased technology inputs. Projections suggest that grain output would reach only some 215 million tons in 1985 and average 212 million tons during 1981-85. Even to achieve that level, the poor crop already recorded in 1981 means that production in 1982-85 must average 225 million tons, 20 million tons above the average for 1976-80.

"Good climate"—this projection is based on the assumption that the climate during 1981-85 replicates the average conditions recorded during 1970-74, a period of generally stable, favorable climate in the Soviet grain region. Grain production for the five-year period would average about 230 million tons with a 1985 crop of 233 million tons.

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[14] Given the production record for the past two decades and the impact of climate described in this paper, there was a 0.27 probability as of 1980 that the 1981-85 plan for average annual grain production could be met. With the 1981 crop failure, the probability of meeting the 1981-85 target drops to 0.001. These calculations are based on the methodology described in the Appendix.

"Poor climate"—if conditions approximate those of the early 1960s, when the climate was poor in comparison with the climate in the late 1960s and most of the 1970s (but actually near the long-term norm established prior to 1960), grain output in 1981-85 would average about 183 million tons with a 1985 crop of 186 million tons.

In the event that the "poor climate" scenario occurs, there is little that the Soviets could do to alter the outcome, as technology would be relatively ineffective. In the more likely event that the "average climate" case prevails—or even if "good climate" should occur—Soviet success in raising grain output will increasingly rely on technology. As previously noted, however, mineral fertilizer plays a key role in this regard, but deliveries of fertilizer to agriculture in recent years have faltered. Shipments were to grow at an average annual rate of 9.7 percent during 1976-80, but largely because of failure to adequately expand capacity in the chemical industry, the average annual rate of growth achieved was only 2.3 percent. A similar performance in 1981-85 would mean that technology would not provide the necessary push to dramatically increase grain production in the Eleventh Five-Year Plan period.

No matter which weather assumption prevails, grain production is likely to continue to fluctuate from year to year. Given the variability exhibited in the past, there are two chances out of three that production will fall within a 200-million-ton to 225-million-ton range. Even so, bumper crops as well as crop failures could, and probably will, occur. Initial Soviet plans for production of meat and other livestock products during 1981-85 suggested that by the end of the period some 256 million tons would be needed yearly for food, feed, and other uses during 1981-85.[15] Thus, the choice for the leadership is to import massive—perhaps even record—amounts of grain in most years or to accept a sharply lower standard of living as measured by per capita availability of meat.

APPENDIX.—PROJECTING SOVIET GRAIN PRODUCTION

The methodology used in this paper to assess grain production prospects for 1981-85 is a modification of the technique described in "USSR: The Impact of Recent Climate Change on Grain Production," Central Intelligence Agency, ER 76-10577, October 1976. Most projections of grain production assume that climate remains constant and that any upward trend in grain yields is the result of improved technology. Such an assumption ignores the significant improvement in the climate in the Soviet Union's grain belt that occurred by chance between the mid-1960s and mid-1970s. Alternatively then, the variance in grain yields is assumed to come from two sources—weather and technology—and the problem is to separate their effects for the period under review.

To differentiate the effects of climate and technology, a model was constructed to describe winter and spring wheat yields for 27 crop regions in the USSR during 1962-80 using weather variables—average monthly temperatures, precipitation, and soil moisture—and multivariate regression analysis. Data for 1962 through 1975 were used to develop a global relationship between weather and winter and spring wheat yields. A global equation was used to increase the degrees of freedom of the model and to expand the range of climate parameters encompassed by the model. Wheat, to a first approximation, grows according to absolute rather than relative climate so the global equation greatly increased the number of events that could be analyzed. Secondly the range of climate from the Baltics to Kazakhstan provided a means of measuring the quadratic toxidity curves of climate. Regional models tend to give a weak linear negative correlations with rainfall in the Baltics while showing strong positive relationships in the arid regions.

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[15] A more detailed discussion of the requirements for grain in the Soviet Union is given in "USSR: Long-Term Outlook for Grain Imports," Central Intelligence Agency, ER 79-10057, January 1979.

The global equation was then solved for each crop region and weighted by sown area to give estimated annual, country level winter and spring wheat yields for 1962–80 as follows:

$$\hat{Y}_{ww} = 5.92753 + 0.1470\ P_2 - 4 + 0.03743\ P_{5\text{-}6} - 0.08211\ SM_6$$

$$\begin{aligned}\hat{Y}_{sw} = 2.57293 &+ 0.04510\ T_6 - 0.22351\ T_7 + 0.20918\ P_{2-7} + \\ &+ 0.09113\ SM_{3\text{-}7} - 0.00039\ SM_{3\text{-}7}^2\end{aligned}$$

where:

$\hat{Y}$ = estimate of winter wheat (ww) and spring wheat (sw) yields

$P_{i\text{-}j}$ = total precipitation for months i through j (mm)

T_i = mean temperature for month i (°C)

$SM_{i\text{-}j}$ = mean soil moisture for months i through j (mm)

Estimates of winter and spring grain yields were made by regressing estimated winter and spring wheat yields against actual winter and spring grain yields as follows:

$$\hat{Y}_{wg} = 10 + .33I_{ww}$$

$$\hat{Y}_{sg} = 1.6 + I_{sw}$$

where:

$\hat{Y}$ = estimate of winter grain (wg) and spring grain (sg) yields

Winter and spring wheat yields were used as surrogates for winter and spring grain yields in the initial calculations because of a lack of accurate regional data for grain other than wheat. Inasmuch as there is a high correlation between wheat yields and yields of all grain including wheat, this procedure is believed to have little influence on the results.[1]

The result are estimates of winter and spring grain yields which reflect only the effect of climate (Appendix Table 1). Examination of these estimates and actual winter and spring grain yields for 1962–80 suggest the following:

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[1] The coefficient of determination (r^2) between winter wheat yields and yields of all winter grains including wheat is 0.83; the r^2 between spring wheat yields and yields of all spring grains including wheat is 0.82.

Climate between 1962 and 1968 was the least favorable during the 1962–80 period;

Climate between 1969 and 1974 was the most favorable during the period;

Climate for 1979 and 1980 was near the average for the period;

Most of the improvement in spring grain yields is explained by climate;

Some factor other than climate is responsible for much of the improvement in winter grain yields, and the effect of that factor is waning.

APPENDIX TABLE 1.—USSR: GRAIN YIELDS, ACTUAL AND ESTIMATE, 1962–80

[Tons per hectare]

Year	Winter grains		Spring grains	
	Actual	Estimate[1]	Actual	Estimate[1]
1962	1.32	1.59	0.99	0.90
1963	1.08	1.53	.74	.74
1964	1.12	1.64	1.15	1.28
1965	1.34	1.59	.78	.89
1966	1.60	1.73	1.28	1.26
1967	1.50	1.66	1.10	1.13
1968	1.57	1.57	1.33	1.26
1969	1.60	1.94	1.26	1.39
1970	1.93	2.09	1.45	1.47
1971	2.00	1.92	1.37	1.39
1972	1.66	1.59	1.33	1.38
1973	2.36	2.07	1.58	1.37
1974	2.09	2.00	1.36	1.39
1975	1.67	1.60	.93	1.03
1976	2.22	1.92	1.62	1.32
1977	2.20	2.12	1.30	1.24
1978	2.66	2.05	1.57	1.46
1979	1.91	1.56	1.27	1.47
1980	1.93	2.06	1.34	1.41

[1] Estimates of winter grain and spring grain yields derived from a weather/yield regression model. Estimates reflect the affect of weather but not of technology; therefore the difference between estimated and actual yields is assumed to represent the impact of technology.

The other factor influencing winter grain yields is presumably technology. The rate of change of technology, if present, should be fairly stable from year to year for any single crop region and should approximate a linear time trend, as follows:

$T=b+ct$

where

T=technology
t=time in years
$c=T/t$
b=constant

The non-climate factor influencing winter grain yields behaves accordingly. Moreover, if indeed this factor is technology, the observation that winter grain yields are influenced to a significant degree while spring grain yields are influenced hardly at all can be explained. The influence of technology is weather dependent. That is, good weather years allow technology to increase yields, while in years of poor weather the effect of technology is less evident. It is therefore appropriate that technology be unevenly applied, with priority given to those areas with the highest marginal rate of return, that is the regions with the best climate. In the USSR, the climate of the winter grain regions is relatively better suited for grain production than is the climate of the spring grain regions. Finally, the observation that this nonclimate influence on winter grain yields was pronounced during 1962-74 but has waned since also supports the presumption that this is a technology influence. From the mid-1960s to the mid-1970s, as shown earlier, the Brezhnev regime greatly increased the flow of equipment and other material—especially fertilizer—to agriculture. Fertilizer deliveries to agriculture have failed to grow as rapidly during 1976-80; that performance mirrors the observed nonclimate effect in winter grain yields.[2]

Forecasts of the impact of technology on winter and spring grain yields during 1981-85 were made using two approaches. First, time trends for winter and spring grain yields for all periods of ten years or longer were projected to 1985; no attempt was made to isolate the effect of climate or technology. Second, for those same periods an estimate for average climate during 1962-80 was used in a regression with time to project yields for 1985; this approach removed the effect of climate and should be a more accurate projection of technology effects. As expected, the latter approach provided more stable projections and was adopted for this paper. Yields were converted to production by using a 30 million hectare area for winter grains and a 100 million hectare area for spring grains.[3]

The uncertainty in the projections stems from the modeling process—that is, the effort to project the impact of technology—and from the assumptions regarding future climate. With respect to technology, a choice of years must be made on which to base projections of the impact of technology on grain output. All combinations of years were examined, but only three will be presented here. The use of 1962-74 for the base period results in the highest trend; 1972-80 results in the lowest trend; and 1962-80 results in a trend between the two (Appendix Table 2). Again, the model is believed to be more accurate with a longer time series, therefore the trend based on the 1962-80 period was used for subsequent calculations and the extreme trends were assumed to be outside limits. The result is an expected mean all grain production for 1981-85 of 212.5 million tons with a standard error of estimate of 6.2 million tons.

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[2] For a detailed discussion of the impact of fertilizer in grain production in the USSR, see "The Impact of Fertilizer on Soviet Grain Output, 1960-80," Central Intelligence Agency, ER 77-10557, November 1977.

[3] Because the harvested area is often smaller than 130 million hectares there is an upward bias to projected output of about 6 million tons.

APPENDIX TABLE 2. USSR: COMPARISON OF GRAIN PROJECTIONS, 1981–85, BASED ON TECHNOLOGY [1]

	1981–85 mean grain production (million tons)				
	Base period	Technology growth (per year)	Winter grains	Spring grains	All grains
Highest trend years	(1962–74)	3.00	76.0	156.0	232.0
Lowest trend years	(1972–80)	0.00	60.1	135.0	195.1
Entire period (most likely)	(1962–80)	1.54	68.0	144.5	212.5

[1] Technology includes all factors affecting grain production except climate.

Forecasting the weather for the next five years remains impossible, but the uncertainty resulting from the influence of climate can be quantitatively expressed. The standard deviation of the five-year mean for the estimates of all grain production (not including a technology trend component) is currently 12.2 million tons and is growing slightly as technology improves. When the uncertainty from both sources is considered, the result is a forecast of 212.5 million tons plus or minus 13.7 million tons for mean all grain production during 1981–85.[4] Thus, there is a 95 percent certainty that average annual grain production during the Eleventh Five-Year Plan period will be more than 185.1 million tons but less than 239.9 tons.

Finally, 1981–85 grain production was forecast using the 1962–80 climate/technology trend with varying assumptions about the climate probable in 1981–85. Three cases were explored in detail based on the assumption that climate would be good (that is replicate the average conditions of 1970–74), climate would be bad (replicate the average conditions of the early 1960s), and that climate would approximate average conditions for 1962–80. The results are presented in Section V of this paper.

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[4] The variance from each source of uncertainty is assumed to be independent, and the total variance, then, is the sum of the two variances.

GRAIN EMBARGO AS DIPLOMATIC LEVER: A CASE STUDY OF THE U.S.-SOVIET EMBARGO OF 1980–81

By John C. Roney*

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INTRODUCTION

The future of United States–Soviet agricultural trade remains in doubt more than a year-and-a-half after the termination of the 1980–81 partial grain embargo. Also unresolved, and closely related, is the question of how lasting the effects of the embargo will be on United States–Soviet relations. Will the future bring a return to the high agricultural trade levels of the past, less trade, or none at all?

Despite U.S. desire to the contrary, the Soviets diversified their grain import sources to the extent that the United States was no longer their primary supplier during the period immediately following the embargo. From 1972 through the January 1980 embargo initiation, the United States provided 64 percent of all Soviet grain imports; from the lifting of the embargo in April 1981 through the fall of 1982, the U.S. share was only 26 percent.

As we look toward the future of United States–Soviet relations, several questions come to mind. Is another grain embargo of the Soviet Union a conceivable possibility? Is a grain embargo, in fact, a potent tool of foreign policy? Based on the lessons of the 1980–81 experience, could another grain embargo have a significant economic and political impact on the Soviets?

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This paper attempts to answer these questions by examining the decisionmaking process that led to the 1980-81 embargo, assessing the effects of the embargo—on the United States as well as on the USSR—and, from that examination, drawing conclusions about the potency of the grain embargo as a foreign policy tool.

Because of the dearth of literature on the embargo decisionmaking process, the author has based that section on personal interviews with the participants in the process, including National Security Adviser Zbigniew Brzezinski, Defense Secretary Harold Brown, Agriculture Secretary Bob Bergland, a number of sub-Cabinet government officials, and members of the intelligence community who preferred not to be named.

HISTORICAL PERSPECTIVE

Though the United States accounts for less than a fifth of the world's annual grain production, it generally provides more than half the grain traded internationally each year. Despite this dominance of global grain trade, the United States had never, until 1980, overtly singled out its agricultural exports to use as a punitive tool of foreign policy. Possible exceptions might be the United States' strategic use of food aid over the years, the 1973 soybean embargo, the suspension of grain shipments to the Soviet Union in 1974, and a similar suspension in 1975 that included Poland as well as the USSR. Each of the above actions differ substantially, however, from the 1980 embargo.

The United States has always used food aid more as a carrot than as stick—for rewarding countries in U.S. favor rather than for punishing transgressors.

The 1973 and 1974 actions were taken for economic rather than political reasons. In both cases the export halts appeased consumer groups who were railing against escalating food prices, but infuriated farm interests. Farm interests objected vehemently to the subsequent drops in commodity prices, the lack of compensation for cancelled export contracts, and the erosion of the United States reputation as a reliable supplier.[1]

The 1975 suspension was depicted at the time, like the 1973 and 1974 actions, as being taken for purely economic reasons. It was also, however, a largely unsuccessful attempt by the Ford administration to exert some political pressure on the Soviet Union. According to one account, President Ford made the suspension decision based on Secretary of State Kissinger's argument that the suspension would give the United States a lever that "could conceivably calm Soviet behavior in the Middle East and elsewhere." [2]

In the negotiations with the Soviets to end the suspension, State Department officials attempted to arrange a long-term agreement that would link U.S. grain, which would be sold at above-market prices, to Soviet oil, which would be bought at below-market prices. The Soviets, however, flatly refused to make any linkage with oil.

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[1] Philip Paarlberg, "Causes and Consequences of Restrictions on U.S. Agricultural Exports, 1973-75," unpublished paper, U.S. Department of Agriculture, 1980.

[2] Roger B. Porter, "The U.S.-USSR Grain Agreement: Some Lessons for Policymakers," Public Policy, Fall 1981.

A grain-only agreement did end the suspension and, to some extent, the extreme volatility that had characterized U.S.-Soviet grain trade up to that point (see table below). The agreement stipulated that, beginning in October 1975, the Soviets would purchase at least 6 million tons of U.S. grain for each of the subsequent 5 years. The Soviets could purchase up to 8 million tons without any prior consultation with the U.S. Government, but would have to obtain U.S. approval for sales beyond that level.

USSR GRAIN PRODUCTION AND TRADE, 1970-82

Year (July-June)	Production	Total net imports	Imports from U.S.
1970-71	186.8	−7.2	0
1971-72	181.2	1.4	2.9
1972-73	168.2	21.0	13.7
1973-74	222.5	5.2	7.9
1974-75	195.7	0.4	2.3
1975-76	140.1	25.4	13.9
1976-77	223.8	7.7	7.4
1977-78	195.7	16.8	12.5
1978-79	237.4	12.8	11.2
1979-80	179.2	30.2	15.2
1980-81	189.2	34.3	8.0
1981-82 [1]	160.0	45.5	15.4

[1] Preliminary data.

Source: U.S. Department of Agriculture.

Though the 5-year agreement was a positive one in the context of U.S.-Soviet grain trade, the Soviets adamance on the oil issue was quite telling. It indicated they were willing to jeopardize the negotiations to end the suspension, rather than give in to the United States on this point.

The Soviets' proclivity to gamble was probably based on two factors: first, their willingness to cut back on domestic consumption, as they had during the 1974 suspension, rather than come begging to the United States for grain; second, their apparent perception that the U.S. need for the Soviet market paralleled the Soviet need for U.S. imports—a perception that was probably underscored by the massive pressure the Ford Administration was receiving from powerful farm interests to cease the suspension. The Soviets must have calculated that the longer they held out, the weaker the U.S. position would become.

The 1975 experiment with grain as a foreign policy tool might have taught U.S. policymakers a lesson for years to come about the balance of power in U.S.-Soviet grain trade. As the 1980 experience demonstrates, however, it apparently did not.

U.S.-Soviet grain trade grew fairly steadily during the first 4 years of the agreement and during the early part of the 1979/80 (October-September) year appeared to be heading for a record level of over 25 million tons. The Soviet invasion of Afghanistan in December 1979 and President Carter's January response to that action abruptedly halted that trade surge.

THE 1980-81 EMBARGO

An examination of the manner in which the 1980 embargo decision was made, structured, and presented to the public is critical to the discussion of its purpose and its eventual effectiveness. Some elements of the events of the week preceding and the week following the embargo announcement strengthened the action; others virtually doomed it.

The decisionmaking process

The White House began considering possible responses to a Soviet invasion of Afghanistan on December 10, 1979, when the Soviets first began massing troops on the Afghan border. The discussions on a response intensified after the actual invasion on Christmas Eve.

The options initially considered were: (1) to do nothing; (2) to take military action; (3) to impose some set of economic and cultural sanctions. The military option was never seriously considered and the President apparently was firmly opposed to the option of ignoring an action he later termed "the greatest threat to world peace since World War II."

The National Security Council (NSC) and Cabinet members, according to Agriculture Secretary Bergland, flatly rejected the Soviet explanation of the invasion as an attempt to halt the flow of Afghan insurgents into the Soviet Union. Defense Secretary Brown recalls that the Administration saw the invasion both as "a sign of Soviet expansionism in general," and, perhaps more significantly, as "a demonstration of their willingness to use force" to realize their expansionist aspirations. National Security Adviser Brzezinski echoes this view, adding "it was the first time the Soviet Union had openly used its military forces outside the Soviet bloc since World War II."

Once the policymakers had determined that some response was called for, they then began to consider the range of possible sanctions—a total trade embargo, a total or partial grain embargo, an Olympic boycott, etc.—and their potential impacts. The grain embargo was always high on the list.

Though Brzezinski says that he asked for both CIA and USDA analyses of the potential impact of an embargo on the Soviet Union, none of the top USDA officials recall ever having received such a request from the White House. The NSC might have decided to keep the analysis in-house to avoid the possibility of leaks—USDA was at that time under investigation concerning the leakage of some classified information to the trade. Brown cites "the view that USDA was speaking for farmers, so their numbers might have an unconscious bias."

Asked in a recent interview why USDA was not requested to provide any numbers, Dale Hathaway, who was Under Secretary of Agriculture for International Affairs and Commodity Programs, summed up: "They didn't trust us."

Nevertheless, newspaper reports that a grain embargo was being considered prompted Hathaway and Howard Hjort, USDA's Director of Economics, Policy Analysis, and Budget, to launch on December 31 an investigation of their own on the potential impacts of an embargo with, or without, the cooperation of Argentina, the world's second leading coarse grain exporter.

About the time that Hjort was gathering a small team of USDA analysts to estimate the impact of varying degrees of embargo, the White House was already reviewing an impact estimate. The CIA, in its current intelligence daily, had provided the White House its first, albeit rough, calculation of what the "potentially maximum impact" could be. The CIA had assumed that of the 25 million tons of U.S. grain the Soviets had already contracted to purchase in the fifth year of the long term agreement (10/79–9/80), Moscow would be denied the difference between the 25 million tons contracted and the 4 million tons that had already been shipped.

The CIA concluded that this 21 million tons of grain could have yielded roughly 3 million tons of meat, an amount equal to about 20 percent of 1979 Soviet meat output. The CIA's calculations were based on official Soviet feed coefficient ratios and the meat output estimate was on a pork-equivalent basis.

The CIA was not asked to do alternative calculations on the potential impacts if, for example, all the 8 million ton minimum promised in the 5-year agreement were provided or if varying degrees of cooperation from the other exporting countries were taken into account. This estimate of a 20 percent impact, based on simplified assumptions, apparently was the number to be quoted by Carter, Mondale and the press during the days and weeks following the embargo. (In a more careful assessment published in March 1980, the CIA estimated that both meat production and livestock levels were likely to decline 2–3 percent in calendar year 1980 as a result of the embargo.)

The 20 percent figure did not come from USDA. The evening of January 2, Hjort delivered to the Vice President a USDA assessment that predicted, in the event the 8 million ton minimum was honored, a 1–3 percent drop in Soviet meat production. The range hinged on the extent of cooperation of other exporters and the amount of stock drawdown by the USSR. The eventual outcome for the Soviets was, in fact, a 3 percent decline in meat production during 1980.

By the time the USDA study was complete, the President had apparently already decided to go ahead with the embargo. According to Bergland, Carter made the decision the afternoon of January 2.

Carter almost certainly would *not* have made a different decision had he been aware of the USDA prediction before January 2. His commitment to the concept of grain embargo was evidently considerable from the outset.

Nonetheless, Bergland did present the USDA findings at a Cabinet session on January 3, suggesting the embargo would be "a major inconvenience to the Soviets, but it would not bring them to their knees." Bergland says that some at the meeting disagreed, arguing that the effect would be greater. The Agriculture Secretary says his "nonfarm colleagues in the Cabinet would not understand the lag between a drop in feed supplies and a drop in meat production."

Though the embargo decision had already been made, Bergland's points at the January 3 session were not necessarily moot. Had more attention been paid to the USDA findings at that time, White

House officials might have been less inclined to use the 20 percent figure. That prediction created unrealistically grandiose expectations for embargo results that never came close to being fulfilled; it also created some confusion during the weeks following the embargo as USDA officials made much more modest predictions.[3] [4]

The actual purpose of the January 3 Cabinet session was to resolve questions on the scope of the embargo and the flexibility of the U.S. regarding the 8 million ton minimum it had promised in the 5-year agreement. White House lawyers, who had been grappling with the question for days, advised the President late January 3 that the agreement was as binding as a treaty. His advisors suggested that violating the agreement would set a dangerous precedent in terms of U.S. relability as a political or a trading partner.

Carter assented, and the embargo was structured to allow shipment of the remaining 3–4 million tons of the 8 million ton minimum. The U.S. was thus denying the USSR 17 of the 25 million tons of U.S. grain that the Soviets had ordered by that time for the trade year ending September 30, 1980.

Political considerations

The extent to which Carter was influenced by domestic political considerations in making the embargo decision is unclear.

During the pre-decision discussions Secretary Bergland apparently did not attempt to dissuade Carter from the embargo, but did argue successfully that farmers and, perhaps, grain traders should be protected from losses associated with lower commodity prices or cancelled contracts. Bergland was only partially successful in arguing that the embargo should be across the board—that all U.S. exports to the Soviets should be halted. The embargo was extended to "high technology and other strategic items" but the Commerce Department was successful in arguing against embargoing other exports that were "nonstrategic" and/or easily replaceable.

Bergland had correctly anticipated that farm groups would not support the embargo unless farm prices and income were somehow protected and unless farmers did not perceive themselves to be the only segment of the population that was forced to bear the burden of the embargo. The hue and cry that had gone up from farm groups following the Nixon soybean embargo of 1973 and the Ford grain sale suspensions in 1974 and 1975 were still ringing in the ears of policymakers. In fact, Carter had exploited farm resentment of those moves—for which farmers were never compensated financially—to help him defeat Ford in the 1976 campaign.

Some observers have argued that Carter needed to take the embargo action because he perceived the erosion of his image as a decisive, effective leader. He had made little progress against inflation, the SALT approval had stalled in Congress, and the Iran hostage crisis was already two months old. The Afghan invasion provided Carter the opportunity to take a tough, decisive stand against the country perceived as the United States' greatest enemy.

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[3] John Hardt, "An Assessment of the Afghanistan Sanctions: Implications for Trade and Diplomacy in the 1980's," Library of Congress, April 1981.

[4] Under Secretary of Agriculture Hathaway, for example, testified on January 22, 1980, before the Subcommittee on International Finance of the Senate Committee on Banking, Housing and Urban Affairs that the probable drop in Soviet per capita meat consumption in 1980 would be about 4 percent.

Some insiders argue, however, that Carter decided on the embargo, and subsequent Olympic boycott, not to bolster his domestic image but *in spite of* the damage he thought the decisions would do to him politically. Prior to the embargo decision, White House press secretary Jody Powell sent Carter a memo advising him not to enact the embargo because it would hurt him politically. According to NSC member Stephen Larrabee, the President's written reply was "I know, but I have to do it."

The image of Carter that emerges from conversations with officials near him during the decisionmaking process is that of a President "deeply troubled" and "angry" over an action that he perceived to be a genuine threat to global peace. The fact that Carter was willing to take the embargo step just two weeks prior to the Iowa caucuses lends some credence to this notion. Says Brzezinski: "He knew it was going to hurt him in that Iowa thing that was coming up then," but that Carter perceived a strong response to the Soviets to be "absolutely necessary."

Foreign cooperation

It should have been clear to Carter that for the embargo to be successful the United States would have to have the cooperation of other exporters. For, though the U.S. holds a substantial edge in world grain trade, it has no monopoly.

The embargo was to halt shipment of 4 million tons of U.S. wheat to the Soviets and 13 million tons of corn—the world's most widely used coarse grain, mainly for livestock feeding. In 1978/79, the U.S. had accounted for 45 percent of the 72 million tons of wheat traded globally, while Canada, Australia and Argentina combined accounted for a third. The same year, the U.S. had accounted for two-thirds of the world's coarse grain exports, while its three major competitors accounted for a little under a fifth.

When Carter announced on January 4 that he was halting shipment of 17 million tons of U.S. grain to the Soviet Union, he said:

> After consultation with other principal grain exporting nations, I am confident that they will not replace these quantities of grain by additional shipments on their part to the Soviet Union.

The President was either misinformed or intentionally misleading when he made that statement. There is no evidence either Carter, any top White House official, or any Cabinet member ever spoke with officials of the other grain exporting countries before the embargo.

About a week before the announcement, the State Department cabled its embassies and instructed U.S. officials to inform the foreign ministries in their respective countries that the U.S. was considering a number of possible sanctions against the USSR, that a grain embargo was one of these, and that the U.S. would like to learn whether they would be inclined to support such an action.

The day before the announcement, Bob Swift, agricultural counsellor at the Australian embassy in Washington, walked into Under Secretary Hathaway's office with a copy of a cable sent to him from Australia, asking whether there really was going to be an embargo. Hathaway, who still did not know that the President had made the decision, could only imply to Swift that an embargo was a very real possibility. The incredulous Swift left, saying that a matter of the magnitude of Australian cooperation in a U.S. led grain embargo could not be settled by foreign ministries but would have to be discussed by their heads of state. When Bergland was asked whether Carter contacted any head of State, he responded "I don't know." Other officials indicated that Carter did not speak with any heads of state before the announcement.

The State Department cables apparently did not attract much attention from the governments of Canada, Argentina, or the European Community (EC). The only attempts to inform the other exporters that the embargo was actually to occur took place just a few hours before President's nationally televised announcement the evening of January 4.

Bergland informed his staff of the President's embargo decision at 3 p.m. on Friday, January 4, after the Chicago commodity markets had closed for the weekend, and six hours before the President was to go on national television. Bergland instructed his top aids to begin immediately calling Capitol Hill officials to learn how they "might" react to an embargo and then at 6 p.m. to begin calling leaders of farm groups, major grain traders, and the other exporting nations.

The task of lining up the support of the other exporting nations fell to the associate administrator of USDA's Foreign Agricultural Service, Tom Saylor. At 6 p.m., while Secretary Bergland, Deputy Secretary Jim Williams, and Under Secretary Hathaway were calling U.S. farm leaders and grain traders, Saylor began a frantic effort to contact sub-Cabinet level officials of the EC, Canada, Australia, and Argentina.

With the help of USDA agricultural attachés, two of whom he had gotten out of bed, Saylor was able to contact Australia's deputy minister of foreign trade, the coordinator of Canada's grain trading board, and the deputy to the EC's director general for agriculture. None committed themselves to cooperation with the embargo at that point. Australia reportedly sent an Air Force jet to the outback to retrieve its Minister of Agriculture from a hunting expedition for a 3 a.m. emergency Cabinet meeting to decide that nation's response to the embargo.

The Argentines were on holiday and no upper-echelon officials were reached. Said Hathaway: "The Argentines learned about it in the newspaper the next morning." USDA chief economist Hjort later observed: "This was bungled. If it had been handled better, the Argentines probably would have cooperated."

In a pre-announcement press briefing in Washington at about 6 p.m., a reporter asked Jody Powell whether the U.S. had the support of the other exporters. "Yes for the EC, Canada, and Australia," Powell replied. "What about Argentina?" a reporter asked. Powell's response: "They don't count for these products." As indicated earlier, Argentina is the world's second leading coarse grain exporter and has been for more than 10 years.

Immediate aftermath

The immediate reactions to President Carter's embargo were a mixture of surprise and general endorsement. Only Carter's campaign opponents, with the exception of John Anderson, condemned the decision.

The surprise reflected the Administration's success in maintaining the secrecy of the embargo discussions. Though the Soviets had begun to step up purchases of U.S. grains the week before the announcement as rumors had spread, the commodity markets had not responded with any major price fluctuation. The Administration on January 5 suspended all futures trading in grains and oilseeds for the first two days of the following week to prevent a potential market collapse and give the market ample time to evaluate—and take faith in—the price protection plans Carter had promised when he made the embargo announcement. Prices did drop considerably when the markets reopened, but recovered within a few weeks.

The favorable response politically to the embargo decision reflected the Administration's success in appealing to Americans' sense of patriotism. Farm leaders, reassured by the Administration's promises of producer price and income protection, gave grudging approval. Grain traders rushed to Washington that weekend and by Monday also had reassurances that they would not incur substantial losses.

Within several days Canada, Australia, and the EC each had announced their support for the embargo. But Argentina, already unfavorably disposed toward the Carter regime because of its pressure on the Argentines over human rights issues, and apparently miffed at not being informed beforehand, refused on January 10 to join the embargo. On January 6, Secretary Bergland had called for a meeting of the other exporting natins to discuss the embargo; Argentina did agree to attend the discussion.

The January 12 meeting in Washington of sub-cabinet level officials of the U.S., the EC, Canada, Australia, and Argentina yielded some ambiguous results. Under Secretary Hathaway, who chaired the meeting, announced at its conclusion that "there was general agreement these governments would not directly or indirectly replace the grain the United States would have shipped to the Soviet Union." Hathaway quoted the Argentine representative, the president of their national grain marketing board as stating: "In no way does the Government of Argentina intend to take trade advantages from the present international situation." Both statements implied a reversal of the Argentines' earlier position.

But the Argentine representative apparently had overstepped his bounds. Hathaway describes the subsequent events this way: "As soon as the agreement hit the wires he (the Argentine delegate) got a call from Buenos Aires to deny the statement attributed to him." The denial caused some embarrassment for the Administration and for Hathaway, who was thought to have read too much into the Argentine position. But Hathaway insists he had not misunderstood the Argentine delegate. "The statement I announced was what he had written for me. He was simply overruled. He called me later to apologize."

The final blow came on Janurary 16, when the Argentine Minister of Argriculture stated flatly in Buenos Aires that Argentina would not participate in the embargo. That opened a huge hole in the embargo wall and later led to a number of major cracks that the January agreement was not cohesive enough to prevent.

The delegates from the EC, Canada, and Australia had not promised to cut exports off completely, but had agreed to maintain their shipments to the Soviets at "normal and traditional" levels. They could hardly have been expected to suspend sales completely when their average exports to Soviets had been running 1-3 million tons each, a fraction of the 8 million tons the United States was still going to send. The cracks occurred, however, after the Canadians and the Australians saw the Argentines moving into a market that could have been theirs. Each of the three countries ultimately sold the Soviets record amounts of grain, despite their "normal and traditional" standard. The total amount of grain provided to the Soviets by the three exporters in 1979/80 was double their average for the preceding 7 years.

Why did the United States agree to as loose a promise from the other exporters as "normal and traditional?"

"Because that's the best we could do," says Hathaway. USDA official Saylor, who participatd in the January 12 negotiation, concurs: "We were afraid if we pushed them any further they'd rebel completely. Grain trade is relatively more important to them than it is to us."

Saylor's latter statement may be correct on a political basis, and it is, for the most part, a fair assessment economically. Grains make up about 8 percent of all U.S. exports. In Australia the share is 13 percent and in Argentina a whopping 30 percent, though Canadian grain sales average only abcut 6 percent of their total exports. The higher percentages for Australia and especially for Argentina help to explain their reluctance to join in the U.S. embargo. Coupled with U.S-Argentine friction over human rights issues and the lack of advance warning, it is not terribly surprising that the special emissary Carter sent to Argentina three weeks after the embargo began failed to enlist Argentine cooperation.

The embargo remained in effect through 1980. Support for the embargo began to wane as it became apparent the impact on Soviet meat production was not as great as White House officials had predicted, and as other exporting countries gradually moved in to replace the embargoed U.S. grain. The grain embargo issue probably cost Carter politically during the 1980 campaign, particularly in the Midwest where farmers felt they were unfairly carrying all the economic burden of the embargo.

Termination

The embargo presented President Carter's successor in January 1981 with a conumdrum. Reagan had long espoused toughness with the Soviets and he had often endorsed the notion of "linkages"—tying, for example, a U.S./Soviet trade deal to some policy concession by the USSR. The continuation of the embargo, and its potential strengthening, provided Reagan with an opportunity to exert pressure on and, perhaps, gain some concessions from the Soviets.

For Reagan, however, it was an inherited embargo—"Carter's embargo." Reagan had condemned it during the campaign as "unfair hardship to American farmers," and pledged he would lift it. The embargo also conflicted with Reagan's laissez-faire attitude toward the role of government in business and trade. It is worth noting, however, that Reagan was careful never to rule out the viability of the grain weapon as a response to an act that threatened U.S. national security.

Reagan's Agriculture Secretary John Block, former Secretary of Agriculture for Illinois and a farmer himself, was adamantly, ostentatiously, opposed to the embargo. He considered the embargo "useless . . . ineffective and unfair to farmers" but acknowledged that "food is our greatest weapon for peace." Block drew battle lines with Secretary of State Alexander Haig on the issue, calling perpetuation of the embargo "absurd." Haig, on the other hand, was advising the President to keep the embargo in place to continue pressure on the Soviets, who by early 1981 were poised on the border of Poland, and to use it as a lever for possible concessions.

Haig was only able to postpone what many observers thought, and farm leaders hoped, would be the inevitable soon after Reagan's inaugaration. It was not until April 24, 1981, that Reagan lifted the embargo—fulfilling his campaign pledge but insisting he had not weakened his Administration's committment to stop all Soviet "acts of aggression." The following day Haig vowed that the United States would impose a ban on all trade with the Soviet Union if it were to invade Poland.

On December 29, 1981, two weeks after martial law was declared in Poland with strong backing from the Kremlin, President Reagan imposed a ban on sales of all U.S. gas and oil drilling and other high-technology equipment to the Soviet Union. Though grain and other products were not included in the ban, administration officials suggested that such a broadening could occur.

EFFECTS OF THE EMBARGO

The effects of the 1980 embargo on the United States and the Soviet Union are extremely difficult to assess. The short-term effects are hard to isolate from the myriad of other factors—economic or weather-related—that shape agricultural supply and demand. The long-term effects are still unfolding.

On the Soviet Union

The embargo had its greatest impact on the Soviet Union during the first six months. The Soviets in January 1980 were still reeling from one of the worst year-to-year drops in grain production in their history. They had to wait until June for supplies from their 1980 winter grain harvest and were counting on a record-large infusion of U.S. grain to permit them to continue to expand their livestock industry.

The Soviets coped with the shortfall during the first half of 1980, and throughout the embargo, by drawing heavily on its stocks, by bidding supplies away from other importers, and by slaughtering livestock at much lighter weights than they normally would have.

Despite the embargo and disappointing harvests in 1980 and again in 1981, Soviet livestock numbers at the beginning of 1982 were about the same levels they were before the embargo. While critics argue this implies the embargo was ineffective, a look at what the Soviets had been achieving with their livestock industry the 3 years prior to embargo implies otherwise.

During 1980 and 1981, the Soviet cattle herd expanded a total of one half of one percent, compared with a 1978-80 average annual gain of 1.7 percent. Poultry numbers grew a little less than 2 percent, compared with a near 8-percent annual pace since 1977. Hog inventories were not accorded as high a priority by Soviet planners and have fallen 1 percent since January 1980, after 1978-80 average annual gains of 1.6 percent.

Meat production declined 3 percent in 1980 and milk production fell by the same percentage. Despite record meat imports during 1980, per capita meat consumption in the Soviet Union dropped by at least 2 kilograms from the 1979 level of 59 kilograms, to about the same consumption as in 1975—half the U.S. level, and 28 percent lower even than Poland's.

Defenders of the embargo point to the costs to the Soviets of large reductions in valuable grain stocks, of record meat imports, and of the further postponement of any gains in per capita meat consumption levels. Defenders also cite the cost to the Soviets of the higher-than-market prices they had to offer for grain at the outset of the embargo to inspire Argentina to cancel contracts with a number of its traditional customers. This latter view, though, can be deceptive.

According to Howard Hjort, the former USDA chief economist, the Soviets had (uncharacteristically) contracted for a large portion of their 25 million tons of U.S. grain at the peak prices of the summer of 1979. Hjort suggests that, though the prices the Soviets booked with the Argentines following the embargo were substantially higher than the prevailing winter market levels, the new contracts were sometimes at price levels lower than those of the previous summer. "Factor in, too, the fact that the Soviets ended up purchasing considerably less grain than they had planned to before the embargo," says Hjort, "and its hard to argue that the embargo cost them any additional loss of foreign exchange."

The effect of the embargo on the Soviets diminished with time as Canada and Australia joined Argentina in replacing most of the grain the United States had set out to deny the Soviets. The embargo did not visibly alter Soviet policy toward Afghanistan, though it may have influenced Soviet decision-making regarding Poland.

On the United States

The cost of the embargo to the United States is no less difficult to assess than the effect on the Soviets, again because of the changing economic and weather conditions that also affect agricultural prices. Critics claim the embargo hurt the United States more than it did the Soviet Union—an allegation that cannot be proven in the short-run, but could be verified some time in the future as U.S.-Soviet trade patterns unfold.

Commodity prices in the United States plunged immediately after the embargo was announced but returned to pre-embargo levels within a few weeks as the market took confidence in government actions to protect farmers and traders. In contrast to the export restrictions of 1973, 1974 and 1975, the administration this time took elaborate measures to shore up prices by isolating embargoed grain in reserves and buying up canceled contracts. The measures were costly—about $2.2 billion—but apparently effective in the short-run. Much of the embargoed grain remains in reserves, however, and continues to have a price-dampening effect on the market.

The major question mark in assessing the longer-term effect of the embargo on the U.S. is the current status of U.S.-Soviet grain trade. Though the Soviets imported a record amount of grain from all sources and made their second largest annual purchase of U.S. grain ever during 1981/82, the U.S. share of the growing Soviet market has, as indicated earlier, diminished substantially. U.S. grain sales to the Soviets of 15.4 million tons were well shy of the 25 million tons the Soviets had planned to buy in 1980/81, as Argentina replaced the U.S. as the largest Soviet supplier. Failure to regain its share of the big Soviet market, particularly in the absence of strong demand elsewhere, would have to be judged a major cost to the United States of the embargo.

THE EFFICACY OF THE GRAIN EMBARGO AS A DIPLOMATIC LEVER

From the experience of the 1980-81 embargo one can draw some conclusions about the potential power of and the limits on the use of grain as an economic or political weapon.

First, the embargo could have been substantially more effective than it was. Cooperation of the other grain exporters could have been lined up more adroitly; clearer articulation of the objectives and expected impacts of the embargo could have better reinforced domestic support for it; and a more comprehensive scope—all grain, all export products—would have hurt the Soviets more and made U.S. farmers feel less isolated.

Second, grain exports—or food products in general—can only be used as a foreign policy tool under certain very limited circumstances: when all major exporters of the embargoed product cooperate; when domestic political support is in place in the embargoing countries; when the embargoed country is highly dependent on imports of the product embargoed and cannot easily make internal consumption adjustments; when the goal and duration of the embargo is limited and defined; and when moral and ethical implications do not cause a backlash of international disapproval of the embargo measure.

Conditions for effective use

These conditions for effective use of the food weapon each merit some elaboration.

Multilateral cooperation.—A decision to impose an economic sanction must be made quickly and secretly to prevent cushioning actions by the embargoed country and general market disruption. Given these conditions, it is understandable that Carter elected not to initiate international discussions on the embargo issue a week or two before the announcement. The decision was essentially Carter's to make; discussions would have jeopardized the surprise element of the embargo and could have eroded Carter's image of decisiveness in the process.

Nonetheless, the relegation of the responsibility for contacting other exporting nations to an agency staff person, only three hours before the actual announcement, was a damning mistake. If Carter's commitment to the action was as strong as he said it was, he personally should have spoken with the other heads of state before the announcement.

The lack of cooperation from Argentina, then subsequently the other major exporters, was to a large extent the result of inadequate (or nonexistent) prior contact and was by far the most limiting factor in the ultimate effectiveness of the embargo.

Domestic political support.—Because economic sanctions generally cause some economic dislocation in the country initiating them, political support for the sanction needs to be strong. Faltering support can undermine the effectiveness of the sanction and perhaps cause its premature withdrawal.

The Carter administration was able to marshal surprisingly widespread support for the embargo at the outset, but the support eroded rather rapidly for three reasons.

First, the impact of the embargo on the Soviet Union did not meet the somewhat confused set of expectations of the U.S. public. Expectations were not clear because the administration was ambiguous on the objective of the embargo and in its predictions of the impact on the Soviet Union. Perceptions of the embargo's objective ran from forcing the Soviets out of Afghanistan with the pressure of a 20-percent drop in meat production, to sending the Soviets a largely symbolic message of disapproval in the form of a slight setback in meat production. The uncertainty on objectives and expected effects confused and discouraged some of the initial supporters of the embargo.

Second, despite an ambitious effort to the contrary, the administration failed to convince farmers they were not being singled out to bear the bulk of the economic burden of the embargo. Farmers did not perceive that any other domestic sector, with the possible exception of the fertilizer industry, was being hurt by the embargo. Farmers' frustrations grew as they saw the movement of other exporting countries into the Soviet market, a lack of immediate economic or political impact in the Soviet Union, and themselves as the sacrificial lambs in a useless rite.

Third, the administration's decision to honor the 8 million ton minimum of the 5-year agreement, in spite of its avowed fury over the Soviet invasion, confused the public and other exporters on the seriousness of U.S. intentions, directly supplied the Soviets with additional grain, and in general undermined the effectiveness of, and support for, the embargo. The 5-year pact was an executive agreement, not a treaty. Several observers have suggested this left enough gray area that the White House lawyers, after their days of deliberation, probably could just as readily have found the agreement circumventable.

Vulnerability of target country.—The Soviet Union was in a particularly vulnerable position at the time the embargo was announced. It was already importing some 15 percent of its yearly grain needs, it had had a very disappointing grain harvest and six months to wait until the next harvest, and it was engaged in a widely proclaimed attempt to increase the amount of meat in Soviet diets. While these factors boded well for the success of the embargo the Soviets were able to minimize the impact by way of Argentina, some frantic and complicated shipping changes, a big drawdown in its valued reserve stocks, and a lowering of animal slaughter weights.

Goal and duration.—No economic sanction can be effective indefinitely. Leakages will occur, substitutes will be found, or the target country will learn to do without.

The Carter administration's apparent goal was essentially a symbolic one—that of punishing the Soviets for an aggressive act—and was not intended to spur a Soviet withdrawal from Afghanistan or to prevent further invasions indefinitely. As such, the administration, at least privately, should have put a volume or time limit on the extent of the embargo.

Four months into the embargo, Secretary Bergland sent the President a memo in which he observed that the embargo was disintegrating from lack of foreign cooperation, that a perceivable impact had already been felt in the USSR that would diminish with their June harvest, and that that May would be a good time to call the embargo a success and end it. Bergland apparently received no explanation for Carter's rejection of the proposal.

Moral implications.—No disucssion of the viability of food as a political weapon would be complete without mention of the moral implication of such an endeavor. The moral judgment hinges on the type of food embargoed.

Denying a country the basic foodstuffs it needs to keep some segment of the population alive is untenable, short of a condition of war. Practically, such an embargo could steel a country further against the embargoing enemy. Morally, the fact is that the poorest people of the target nation—those who were already powerless in their political system—are the ones who would starve. Politically, the international backlash against a nation, or group of nations, that would pursue a starvation policy could be substantial.

Denial of some non-essential food has less potential for real economic harm, but does not carry with it the moral stigma of a "starvation" policy. The Carter administration succeeded in avoiding—everywhere but within the USSR—the political cost that would be associated with an attempt to starve people. Carter emphasized that the target of the embargo was Soviet livestock—that the embargo would not leave the Soviet people with less food, but with less meat. Indeed, only a quarter of the embargoed grain was wheat; the remainder was the corn the Soviets import to feed to livestock.

CONCLUSION

In conclusion, then, how viable is grain as a foreign policy tool? How likely is it that the United States might again embargo grain exports to the Soviet Union?

Given the limitations of the grain lever, it is extremely unlikely that the United States would enact another grain embargo along the lines of the last one, for several reasons.

First, the Soviet Union is a vulnerable target for such an embargo only if cooperation from other grain exporters is firmly in place. Cooperation could be even harder to obtain than it was in 1980 now that the Soviets have signed long-term bilateral trade agreements with Argentina and Australia, covering volumes of grain now much larger than the amounts traded prior to 1980.

Second, legislation passed in December 1981 would make a grain-only embargo prohibitively costly to the United States. Congress added to the quadrennial farm bill a stipulation that farmers be compensated at an extremely generous rate should the U.S. initiate another grain embargo, for economic *or* national security reasons, unless the embargo covered *all* U.S. exports.

Third, the U.S. and global agricultural supply-demand situation, as of the fall of 1982, would not lend itself to an effective grain embargo. While generally favorable weather pushed world grain production up more than 5 percent since 1980/81, widespread recession has held the gain in consumption to less than 2 percent. Grain exporters have ample supplies and are anxious to sell. This is particulary true in the United States where weak demand and mounting stocks have severely depressed commodity prices. An embargo would exacerbate that situation and probably ignite farm sector opposition, which in turn, would seriously undermine domestic support for the action.

To summarize, the United States experience with a grain embargo has provided a lesson on its limits as an economic sanction. The United States cannot viably use a grain embargo as a tool of foreign policy unless the embargo covers all products, the embargo is multilateral, the target country is particularly vulnerable, time or quantity limits are set, and domestic political support is securely in place. Clearly, the likelihood that such a set of circumstances would materialize in a situation short of all-out war is not great.

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ENERGY, FERTILIZER AND GRAIN PRODUCTION IN THE U.S.S.R.: KEY LINKAGES

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SUMMARY

While the importance of both the agricultural and energy sectors in the Soviet Union is well recognized, the critical linkages between the two sectors are not as often analyzed. This paper discussed the linkages that arise from the fact that natural gas is the primary source of nitrogen fertilizer. After analyzing the relationship between fertilizer use and grain production in the Soviet Union and discussing the potential of the Soviet fertilizer industry, we consider some of the options available to the Soviets for the use and trade of natural gas, fertilizer and grain.

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INTRODUCTION

Soviet energy and agriculture have each received a great deal of attention from Western analysts in recent years. Since the bumper crop of 1978 (237 million metric tons),[1] three disappointing grain harvests (and possibly a fourth) followed by considerable grain purchases from the West have heightened interest in the current and future ability of the Soviet Union to increase production at a rate sufficient to meet growing demand for animal products and other more refined grain products.[2] As Table I illustrates, grain yields and production have recently failed to match their considerable growth of the past few decades. President Brezhnev, in his long-awaited speech of May 24, 1982, on the future USSR's Food Programme, acknowledged the unsatisfactory performance of the agricultural sector, and particularly noted the ever-increasing dependence on food imports as a major strategic concern.[3] The question of whether the Soviets will continue to import massive amounts of grain from the West, and whether the Soviet Union will, as in the

TABLE I.—SOVIET GRAIN YIELDS AND PRODUCTION, SELECTED YEARS, 1953–1981

Year	Grain Yields (kilogram per hectare)	Grain production (million metric tons)
1953 [1]	780	82.5
1956 [1]	990	125.0
1958 [1]	1,110	134.7
1960 [1]	1,090	125.5
1962	[2] 1,090	[3] 140.2
1963	[2] 830	[3] 107.5
1964	[2] 1,140	[3] 152.1
1966–70 average [4]	1,370	167.6
1971 [4]	1,540	181.2
1973 [4]	1,760	222.5
1975 [4]	1,090	140.1
1976 [4]	1,750	223.7
1977 [4]	1,500	195.7
1978 [4]	1,850	237.2
1979 [4]	1,420	179.0
1980 [5]	(7)	189.0
1981 [6]	(7)	165.0

[1] Karcz, Jerzy F., and V. P. Timoshenko, "Soviet Agricultural Policy, 1953–1962," in Jerzy F. Karcz, The Economics of Communist Agriculture, Selected Papers, ed., Arthur Wright, Purdue Univ. (1979) p. 152/153.
[2] USDA, Econ. Res, Svc., USSR Grain Statistics: National and Regional, 1955–75, Bull. No. 564, Jan. 1977, p. 4.
[3] Nove, Alec, "Soviet Agriculture Under Brezhnev," Slavic Review, Vol. 29, No. 3, Sept. 1970, p. 386 from Narkhoz 1967, pp. 326, 425, 446.
[4] USDA, Agricultural Situation, Review of 1979 and Outlook for 1980, p. 35.
[5] The Wall Street Journal, "Soviet Hint Harvest of Grain Below Target," July 17, 1981 p. 30.
[6] The Wall Street Journal, "Soviet Union Omits '81 Grain Crop Figure; Other Sectors Weak," Jan. 25, 1982, p. 26.
[7] Not available.

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[1] USDA, "Agricultural Situation, Review of 1979 and Outlook for 1980, USSR," Supplement to WAS-21,, p. 35.

[2] Karl-Eugen Wadekin, "Soviet agriculture's dependence on the West," Foreign Affairs, 60(4); 882-903, (1982).

[3] Leonid Brezhnev, "On the USSR's food programme for the period ending in 1990 and measures for its implementation," Moscow News, Supplement to Issue 22(3010), May 24, 1982.

past, rely on energy exports to finance the grain imports, is of primary importance not just to the Soviet Union proper but to the entire international community.

In the energy sector, the eventual leveling-off and even decline in Soviet oil exports and production have prompted a heated debate over the likely timing of the decline and its implications for the West.[4] As oil declines in importance in the Soviet energy balance, natural gas is growing, both in production and trade. The implications of increased natural gas trade between the Soviet Union and Western Europe, and the role of Western technology in Soviet gas production, are matters of considerable concern to the United States government.[5]

Despite the heightened attention paid to the individual sectors of energy and agriculture, little discussion has been made of the full range of relationships between the two sectors. Several analysts[6] have noted the most obvious linkage, the foreign exchange earnings generated from energy exports (primarily oil) that have enabled the Soviets to meet grain production shortfalls with imports from the West. But with the declining significance of oil in Soviet energy production and trade, and with the increasing role to be played by natural gas, another major connection between energy and agriculture requires recognition and analysis: natural gas is the primary feedstock for one of the key inputs to agricultural production, nitrogen fertilizer. In the Soviet Union, 95% of nitrogen fertilizer is manufactured from natural gas.[7] Nitrogen fertilizer is, in turn, one of the most important inputs to agricultural production. Adequate supplies of fertilizer to agriculture have been a major Soviet problem recently. Brezhnev[8] made special mention of fertilizer shortages, and according to the USDA,[9] serious production difficulties arose in the chemical industry in 1979 which marked the first in 25 years that Soviet fertilizer production was unable to record an increase.

It is ironic that while Soviet agriculture suffers from fertilizer shortages, the USSR is one of the world's leading exporters of ammonia, the precursor for most forms of nitrogen fertilizer. Soviet sales of ammonia to the United States have generated considerable controversy[10] as, of course, have U.S. sales of grain to the Soviet

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[4] See, for example, "Prospect for Soviet Oil Production," CIA publication ER77-10270 (April, 1977); "Prospects for Soviet Oil Production, A Supplemental Analysis," CIA publication ER77-10425, (July, 1977); Marshall I. Goldman, The Enigma of Soviet Petroleum: Half Empty or Half Full?, London, George Allen & Unwin, 1980 (especially the last chapter); Riva, Joseph P., Jr., "Soviet petroleum prospects, a western geologist's view," In: Energy in Soviet Policy, U.S. Congress Joint Economic Committee Print, June 11, 1981.

[5] Miles Costick and Marc Dean Millot, "The Soviet gas deal and its threat to the West," Current Analysis, II(11):1-24, December 31, 1980; Technology and Soviet Energy Availability, U.S. Congress Office of Technology Assessment, November 1981; Philip Hanson, Soviet Strategies and Policy Implementation in the Import of Chemical Technology from the West, 1958-1978, The California Seminar on International Security and Foreign Policy, March 1981.

[6] Goldman, op. cit., pp. 92-96; Daniel L. Bond and Herbert S. Levine, "Energy and grain in soviet hard currency trade," pp. 244-289 in: Soviet Economy in a Time of Change, U.S. Congress Joint Economic Committee, Vol. II, October 10, 1979.

[7] U.S. Dept. Agriculture, "1979 Fertilizer Situation," December, 1978.

[8] Brezhnev. op. cit., p.2.

[9] USDA, "Agricultural Situation . . .", op. cit., p.15.

[10] The U.S. International Trade Commission ("Anhydrous Ammonia from the USSR," USITC publication 1006, October 1979) found that Soviet ammonia imports were a significant cause of market disruption and should be subject to a quota, although two of the five commissioners dis-

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Union. The possible advantages and disadvantages, both short-and long-term, in Soviet fertilizer export versus domestic use for grain production should be discussed in the light of the entire spectrum of options surrounding the production and trade of energy, fertilizer, and grain.

The options confronting the Soviets in the near future are many. For example, with the increased ammonia production capacity made possible by increased natural gas production, the Soviets might choose either to sell more ammonia to the West, for foreign currency or in exchange for Western plant and equipment, or to apply the fertilizer to their own crops, thereby alleviating some of the need for agricultural imports. Alternatively, Soviet natural gas could be sold to the West without being converted to fertilizer. The most attractive option or mix of options at any point in time will depend upon a host of factors, technological, economic and political, which are difficult to assess at any given moment and which undoubtedly change through time. At a minimum, however, Western analysts should be aware of the natural gas/fertilizer/agriculture linkages and should not attempt to understand one sector in isolation from the others.

We present here an analysis of two major questions bearing upon the energy/agriculture interface. First, what is the role of fertilizer in grain production in the Soviet Union? The response of grain output to fertilizer use must be established in order to evaluate the likelihood of their domestic use of fertilizer in an effort to reduce grain imports from the West. The second question concerns the likely ability of the Soviets to produce more fertilizer, whether for export or domestic use, in the light of their possible future natural gas production. After treating these two issues, we suggest some of the factors impinging upon the various policy options available to the Soviet Union with respect to the production and trade of natural gas, ammonia, and grain.

THE ROLE OF FERTILIZER IN SOVIET GRAIN PRODUCTION

Grain, rather than all agricultural output, was chosen for this analysis because of the key role that grain plays in Soviet agricultural production and trade. Additionally, the case could be made that the output of other Soviet crops would respond similarly (in value terms) to additional fertilizer input at the margin as would grain, on the basis of the diminishing returns to fertilizer exhibited by most crops at high levels of fertilizer application. Since the more favorable response of higher-value, non-grain crops has already resulted in their receiving more fertilizer on the average, marginal additions of fertilizer to these crops are less dramatic in their effects. The techniques of analysis of fertilizer response rate presented here could of course be extended to other crops if space were not limiting. Occasionally we will refer to a single crop type rather than to grain as a unit; this crop is most often wheat, which

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sented. President Carter rejected the commission's recommendation, but later complied for a short time. In June, 1980, the State of California enacted legislation (Senate bill 1301) to provide California's ammonia industry with natural gas at a controlled price, in part a reaction to the lower price of Soviet imports (background information provided by M. Johnson, senior consultant, California Assembly Agriculture Committee).

accounts for roughly half of Soviet grain production, or barley, a feed grain of increasing importance in recent years. Together, wheat and barley generally account for three-quarters of Soviet grain production.

In terms of fertilizer, we will discuss the broader question of grain response to the three major nutrients (nitrogen (N), phosphorus (P), and potassium (K)) rather than just to nitrogen, because the response of crops to fertilizer is not solely a matter of nitrogenous fertilizer input but rather depends upon the balanced application of all three major nutrients. Additionally, the available Soviet data are often in terms of total fertilizer and not disaggregated by nutrient type.

Recently several Soviet as well as Western sources [11] have made reference to the beleaguered Soviet fertilizer situation, yet no systematic analysis of fertilizer production and supply to agriculture is available. Young [12] recently completed a comprehensive study on this subject, and in particular questioned the current assumption in Western literature [13] that the Soviet Union has reached a significant point of diminishing returns to fertilizer input.

The polemic over diminishing returns does not center around the existence or non-existence of the diminishing returns phenomenon but rather centers around the present location of the Soviet Union on the diminishing returns curve.[14] Furthermore, the available literature supporting the diminishing returns argument often does not clearly define whether the alleged saturation is based on biological or economic grounds. From a biological point of view little evidence exists to support the diminishing returns argument because the Soviets are at a comparably low level of world fertilizer usage. Evidence to support this argument will be presented later in the text. The economic argument is more difficult since it has to be established if a marginal increment in fertilizer applied to grain yields an equal or a higher marginal return in grain output, in value terms. Unfortunately, the research on this vitally important topic is simply not available, and the studies which do exist [15] are of questionable methodology.[16]

In the following section, we will take three approaches to estimate the response rate of Soviet grain production to fertilizer application and to determine whether the Soviets have reached a significant level of diminishing returns to fertilizer input. (1) Evidence will be based on official Soviet data, (2) a comparative approach on fertilizer usage in different countries will be presented, and (3) an input-output approach based on a nutrient analysis will be covered. While any one of these approaches must, of necessity, be based upon limited data and simplifying assumptions, conclusions based upon several complementary approaches such as these should be relatively more robust. Before introducing the various approaches, mention should be made of some aspects of Soviet fertilizer figures.

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[11] Brezhnev, op. cit., p.2; Frank A. Durgin, Jr., "The inefficiency of Soviet agriculture versus the efficiency of U.S. agriculture: reality or an idol of the mind?" The ACES Bulletin, XX(3–4): Fall–Winter, 1978; USDA, "Agricultural Situation * * *", op. cit. p.15; CIA, "The impact of fertilizer on Soviet grain output, 1960–1980," ER77–10557.

[12] Brigitta Young, An Analysis of Factors Influencing Soviet Grain Production, unpublished Master's thesis, University of California, Davis, June, 1982.

[13] CIA, "The impact of fertilizer * * *", op. cit.; Roy D. Laird and Betty A. Laird, "The widening Soviet grain gap and prospect for 1980 and 1990," In: Laird, Hajda and Laird (Eds.), The Future of Agriculture in the Soviet Union and Eastern Europe, Westview Press, Colorado, 1977.

[14] Young, op. cit., p.161.

[15] CIA, "The impact of fertilizer * * *", op. cit.; Laird and Laird, op. cit.

[16] Young, op. cit.

NOTES ON SOVIET FERTILIZER DATA

Soviet fertilizer data are often expressed in different forms as well as in different units of measurements. The elemental form of the three major groups of fertilizer is nitrogen (N); phosphorus (P) and potassium (K). In the literature, total nitrogen is usually expressed in its elemental form (N), but phosphorus and potassium (potash) fertilizers are usually expressed in their oxidized forms, P_2O_5 and K_2O, respectively. Where ground rock phosphate is reported separately from higher-grade forms of phosphates, it is generally because phosphates in this form are of low solubility and thus not readily accessible to the plant.[17] The Food and Agriculture Organization of the United Nations (FAOUN) and other statistical publications compile what is purportedly P_2O_5 and K_2O; for the Soviet Union these figures correspond to "nutrient value" in the official Soviet statistics,[18] a classification that is unclear for the following reasons.[19]

The Soviet Union reports two sets of weights, standard and nutrient units. Fertilizer figures given in standard units consist of acutal product weight: nitrogen, phosphorus, potassium, and any other components, i.e. carriers. The nutrient values are calculated from the standard units on the following assumptions of nutrient content: 20.5 percent N (ammonium sulfate), 18.7 percent P_2O_5 (phospahte fertilizer), and 41.6 percent K_2O (potash). While there is always this fixed relationship between standard and nutrient units for each of the three types of fertilizers, when a figure for total fertilizer (nitrogen plus phosphates plus potash) is given it is impossible to make more than an estimated conversion from one type of unit to another, unless the percentage of each of the three types making up the total is known. Unfortunately, in many of the studies cited below, the figure given is that of total fertilizer, so that it is somewhat unclear what the figure represents chemically. Throughout this text we will refer to fertilizer in "nutrient terms", meaning $N+P_2O_5+K_2O$ (or the estimated equivalent), unless otherwise stated, as a conventional unit. These units are purely for standardization, since the chemical form that represents a "nutrient" to the plant can vary.

The analysis of Soviet fertilizer delivered to agriculture and applied to grain is further confounded by the absence of data on specific application rates to certain crops such as wheat, barley, rye and oats. The rate of active ingredients applied to corn-for-grain is reported separately[20] because application rates are much higher for corn than for the other grains (192 kg/ha versus 49 kg/ha in 1979).[21] For an overview of fertilizer delivered to agriculture, and fertilizer applied per hectare of sown land from 1964 to 1980, Tables II and III are included.

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[17] For more information on fertilizer composition, see Nyle C. Brady, The Nature and Properties of Soils, 8th ed., McMillan Publ. Inc, 1974, Chapter 19.

[18] Soviet fertilizer statistics are published annually in Narodnoe Khoziaistvo, hereafter referred to as Narkhoz.

[19] Young, op. cit., p. 164.

[20] USDA, "The U.S. Sales Suspension and Soviet Agriculture, an October Assessment," Supplement 1 to WAS-23, 1981, p. 22 (following Narkhoz).

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[21] USDA, "The U.S. Sales. . .," op. cit., p. 22.

TABLE II.—MINERAL FERTILIZER DELIVERED TO AGRICULTURE, AS REPORTED BY "NARODNOE KHOZIAISTVO SSSR (NARKHOZ)" FROM 1964 TO 1980

[In thousands of tons]

	1964	1965	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Standard weight	21,961	27,066 [1] (26,906)—	36,101	38,843	45,649 (45,379)	50,547 (50,020)	54,795 (53,932)	59,988 (58,472)	65,884 (63,841)	75,718 (73,537)	77,732 (75,010)	79,760 (76,984)	(79,002)	(76,338)	(81,993)
Nitrogen	8,584	11,132	16,847	18,526	22,463	25,279	27,436 (27,346)	30,519 (30,361)	32,908 (32,665)	36,132 (35,798)	35,758 (35,376)	37,129 (36,694)	(37,358)	(36,423)	(40,301)
Phosphate	6,865	8,044 (7,884)	9,351	10,248	11,821 (11,551)	13,584 (13,057)	14,741 (13,968)	15,964 (14,606)	19,320 (17,520)	22,325 (20,478)	24,091 (21,751)	25,259 (22,918)	(24,334)	(24,799)	(25,456)
Rockphosphate	2,972	3,246	4,662	4,471	5,122	4,916	4,756	4,740	4,650	4,731	4,395	4,307	(4,258)	(4,435)	(4,369)
Potash	3,416	4,547	5,231	5,575	6,187	6,703	7,784	8,667	8,914	12,444	13,407	12,981	(12,967)	(10,604)	(11,788)
Nutrient weight	5,040	6,303 (6,273)	8,273	8,885	10,368 (10,317)	11,451 (11,352)	12,530 (12,367)	13,756 (13,470)	14,958 (14,572)	17,665 (17,251)	18,255 (17,739)	18,561 (18,034)	(18,420)	(17,365)	(18,763)
Nitrogen	1,759	2,282	3,454	3,798	4,605	5,182	5,624 (5,606)	6,256 (6,224)	6,746 (6,696)	7,407 (7,339)	7,330 (7,252)	7,611 (7,522)	(7,658)	(7,467)	(8,262)
Phosphate	1,284	1,504 (1,474)	1,748	1,916	2,211 (2,160)	2,541 (2,442)	2,757 (2,612)	2,985 (2,731)	3,612 (3,276)	4,175 (3,829)	4,506 (4,068)	4,724 (4,286)	(4,551)	(4,637)	(4,760)
Rockphosphate	565	617	886	850	973	934	904	901	884	899	835	818	(809)	(843)	(830)
Potash	1,421	1,891	2,176	2,319	2,574	2,788	3,238	3,605	3,708	5,176	5,557	5,400	(5,394)	(4,411)	(4,904)

[1] Figures in (   ) are revised numbers which exclude feed additives. From 1978 onward, Narkhoz only reports figures which exclude feed additives.

Source: 1964 figures from Narkhoz (1964) p. 338; 1965 figures from Narkhoz (1965) p. 353; 1968, 1969 figures from Narkhoz (1969) p. 354; 1970 figures from Narkhoz (1970) p. 339; 1971 figures from Narkhoz (1972) p. 353; 1972 figures from Narkhoz (1973) p. 421; 1973 figures from Narkhoz (1974) p. 383; 1974 figures from Narkhoz (1975) p. 383; 1975 figures from Narkhoz (1976) p. 324; 1976, 1977 figures from Narkhoz (1977) p. 245. Revised figures (excluding feed additives) for 1965, 1971 to 1974 from Narkhoz (1975) p. 383; Revised figures for 1975 from Narkhoz (1976) p. 324; Revised figures for 1976, 1977 from Narkhoz (1977) p. 245; Revised figures for 1978 from Narkhoz (1978) p. 23[illegible] Revised figures for 1979, 1980 from Narkhoz (1980) p. 237.

TABLE III.—FERTILIZER APPLIED PER HECTARE OF SOWN LAND, AS REPORTED BY NARODNOE KHOZIAISTVO SSR (NARKHOZ) FROM 1964 TO 1980

[In kilgrams]

	1964	1965	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Standard weight	99.3	122.5 [1](121.8)	164.2	176.3	207.1 (205.9)	226.6	243.9	264.2	287.1	330.5	336.6	345.0	353.6	341.4	366.5
Nitrogen	38.8	50.4	76.5	84.1	101.9	114.5	123.6	137.2	146.9	160.9	158.8	164.4	167.2	162.9	180.1
Phosphate	31.1	36.4 (35.7)	42.4	46.5	53.6 (52.4)	59.1	63.2	66.0	78.8	92.0	97.6	102.7	108.9	110.9	113.8
Rockphosphate	13.4	14.7	21.2	20.3	23.2	22.3	21.5	21.4	20.9	21.3	19.7	19.3	19.1	19.8	19.5
Potash	15.4	20.6	23.7	25.3	28.1	30.4	35.2	39.2	40.1	55.9	60.2	58.2	58.0	47.4	52.7
Nutrient weight	22.8	28.5 (28.4)	37.5	40.3	47.0 (46.8)	51.4	55.9	60.9	65.5	77.5	79.6	80.8	82.5	77.7	83.9
Nitrogen	8.0	10.3	15.7	17.2	20.9	23.5	25.4	28.1	30.1	33.0	32.5	33.7	34.3	33.4	36.9
Phosphate	5.8	6.8 (6.7)	8.0	8.7	10.0 (9.8)	11.1	11.8	12.4	14.7	17.2	18.3	19.2	20.4	20.8	21.3
Rockphosphate	2.6	2.8	4.0	3.9	4.4	4.2	4.1	4.1	4.0	4.0	3.8	3.7	3.6	3.8	3.7
Potash	6.4	8.6	9.8	10.5	11.7	12.6	14.6	16.3	16.7	23.3	25.5	24.2	24.2	19.7	21.9

[1] Figures in ( ) are revised, as of 1975 Narkhoz.

Source: 1964 figures from Narkhoz (1964) p. 341; 1965 figures from Narkhoz (1965) p. 356; 1968, 1969 figures from Narkhoz (1969) p.357; 1970 figures from Narkhoz (1970) p.342; 1971 figures from Narkhoz (1972) p.355; 1972, 1973 figures from Narkhoz (1973) p. 423; 1974 figures from Narkhoz (1975) p. 385; 1975 figures from Narkhoz (1976) p.326; 1976, 1977 figures from Narkhoz (1977) p. 247; 1978 figures from Narkhoz (1978) p.236; 1979, 1980 figures from Narkhoz (1980) p.238. Revised figures for 1965, 1970 from Narkhoz (1975) p. 385.

Figures for fertilizer applied specifically to grain crops have been available only in recent years.[22] During the 1970's, approximately 50% of the area sown to grain was fertilized with an average fertilizer usage of 49 kg/ha, as illustrated in Table IV. These nationally aggregated fertilizer application data fail to show the tremendous regional disparities. For example, in 1980 in Belorussia, Latvia and Estonia nearly all (97 to 99 percent) of the grain area was fertilized with an application rate of 225 kg/ha or more, whereas in Kazakh SSR only 23 percent of the grain area was fertilized with an average of 9 kg/ha.

TABLE IV.—FERTILIZER APPLIED TO GRAIN

Year	Percent grain area fertilized	Fertilizer application (kilogram per hectare)
1974	48	40
1975	48	42
1976	50	47
1977	52	48
1978	54	51
1979	53	49
1980	57	51

Source: Vestnik Statistiki.

ESTIMATES OF GRAIN YIELD/FERTILIZER RELATIONSHIP FROM SOVIET DATA

The most straightforward method of estimating a yield/fertilizer relationship is to use data for both yield obtained and fertilizer applied in well-designed experiments conducted under a representative, controlled set of climatic and technological conditions. Unfortunately, such a complete set of data is not available for the Soviet Union.

A common alternative practice for estimating the effects of various technological forces on agricultural yields is to use time series data on yields and various inputs.[23] A major problem in this approach is that those variables not explicitly included in the estimation (e.g. other technological inputs, climatic factors) often confound the available data and obscure the relationship in question. Efforts to remove the effects of unwanted variables (e.g. removing the effects of weather through regression [24] or through moving averages [25]) can be misleading.[26] Another limitation of many studies is that, due to the lack of good technological data, time itself is used as a proxy for technology.[27] Thus, existing analyses of Soviet yield/fertilizer relationships are few and limited.

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[22] Fertilizer applied to grain is published annually in Vestnik Statistiki, for the entire USSR and by Soviet Republic.

[23] For examples, see M. L. Wyzan, "Empirical analysis of Soviet agricultural production and policy," Amer. J. Agric. Econ., 63(3): 475–483); and Elizabeth Clayton, "Productivity in Soviet agriculture," Slavic Review, 39(3):446–458.

[24] CIA, "USSR: The impact of recent climate change on grain production," ER76-10577U, October, 1976.

[25] Laird and Laird, op. cit.

[26] Jill Shore Auburn, "Contrasting models of Soviet grain yield as a function of weather and technology," unpublished manuscript (in submission to Agricultural Meteorology); Young, op. cit.

With these cautions in mind, we examine the results of two analyses of the role of fertilizer in Soviet agricultural production. Clayton modeled total Soviet agricultural output (in rubles, 1960–1975) as a Cobb-Douglas function of land, labor, livestock, machinery and fertilizer, and concluded that if fertilizer use were doubled, output would increase by 21 percent.[28] No separate analysis was presented for grain. If the 21 percent figure were to hold for grain, a doubling of fertilizer use from its 1975 value (the last year of Clayton's study) of 42 kg/ha (nutrient units) would increase average grain yield from 1540 kg/ha to 1863 kg/ha; the additional 323 kg/ha from the added 42 kg fertilizer represents an average 7.7 kg grain per kg fertilizer. This extrapolation to grain from an analysis of aggregate agricultural output may be a bit questionable; on the other hand, it may be an acceptable rough estimate for the reasons explained above.

The Central Intelligence Agency [29] compiled estimates of grain response to fertilizer from various sources within the Soviet literature and concluded that the response rate is currently on the order of 1.2 to 1.3 tons of grain per ton of fertilizer in standard units. Using the CIA's conversion figure of 22.4 percent from standard to nutrient units, this figure represents 5.4 to 5.8 kg grain per kg fertilizer in nutrient units. The CIA's figures for response rates broken down by crop and by region (their Table 2) are generally higher, up to 1.7 kg grain per kg fertilizer (standard units), or 7.6 kg grain per kg fertilizer in nutrient terms. These figures are described as "* * * probably averages for each area in the early 1970's as opposed to the marginal response * * * (but) * * * These response rates could be consistent with marginal responses for all regions[30]." The distinction between marginal and average response rates is important in proportion to the degree to which the response of yield to fertilizer exhibits diminishing returns (i.e. is curvilinear). The CIA maintains that Soviet response rates have trended downward considerably since 1964, but this conclusion rests almost entirely upon a single fairly general estimate for 1964 from a Soviet source. Overall, the CIA attributes relatively less of recent Soviet gains in grain production to fertilizer and to technology [31] than do most other analysts; their models and analyses that serve as the basis for this conclusion are controversial.[32]

ESTIMATES BASED ON THE COMPARATIVE APPROACH

Since Soviet data alone are somewhat limited for the estimation of fertilizer response rates, we turn to additional, complementary approaches. One such approach is comparative, in which we compare the USSR to another country or to a whole set of countries to see where the Soviets stand, in relative terms, in grain yields and fertilizer use. Two types of comparative approach are common. In the first, selected grain areas in the USSR are compared to areas within the United States and Canada that are similar in soil, climate and other factors. This approach, as presented by the CIA[33] has been criticized on the grounds that the soil and weather differences between supposedly comparable regions are so great as to invalidate comparison.[34] Since Soviet fertilizer application data for grain are available only at quite high levels of aggregation (republics, spanning considerable variety in soil and climate), it is exceedingly difficult to proceed with this approach.

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[27] CIA, "USSR: The impact of recent climate . . .", op. cit.; Laird and Laird, op. cit.; Auburn, op. cit.

[28] Clayton, op. cit., p. 455.

[29] CIA, "The impact of fertilizer," op. cit., p. 455.

[30] Ibid., p. 6.

[31] Ibid.; CIA "USSR: The impact of recent climate * * *", op. cit.

[32] Paul E. Lydolph, review of CIA's "The Impact of fertilizer", Soviet Geography 19(8): 580–583, 1978, and review of CIA's "USSR: The impact of recent climate * * *", Soviet Geography 18(8):606–608, 1977; Philip Hanson, Trade and Technology in Soviet-Western Relations, Columbia University Press, New York, 1981, p.178; Auburn, op.cit.

The second comparative approach attempts to factor out the peculiarities of soil or climate in any one country by looking at response rates across a wide range of countries. The resulting picture contains a lot of scatter due to conditions unique to individual countries, but in the aggregate gives an indication of the overall response of grain to fertilizer application and the position of the Soviet Union within this larger context.

This second approach was taken by Sillampää in a study of the response of wheat to fertilizer [35] in which he constructed a regression model to demonstrate the relationship between wheat yields and fertilization levels of 44 countries during two five-year periods: 1948 to 1952 and 1962 to 1966. While Sillampää refers to fertilizer use per wheat hectare he actually uses data on fertilizer consumption ($N+P_2O_5+K_2O$) per arable hectare [36] since data on the former measure are not available.

Sillampää's regression analysis showed that the USSR used insignificant amounts of fertilizer during the earlier period, and while consumption increased during 1962 through 1966, the amount was still in the lower ranges of world fertilizer consumption. With an annual fertilizer application of 5 kg nutrients per hectare of arable land between 1948 and 1952, the Soviets achieved an average national wheat yield of 840 kg per hectare. Average annual fertilizer application increased to 19 kg per hectare of arable land between 1962 and 1966, and the commensurate average annual wheat yield was 1,045 kg/ha. The response rate that follows from the changes in fertilizer use and yield between these two periods is thus 14.6 kg grain per kg fertilizer. This figure, although falling squarely on Sillampää's regression curve for response rate as a function of fertilizer use,[37] probably overstates the role of fertilizer for the Soviet Union in this time period. Due to the combined effects of World War II and Stalin's disastrous agricultural policies, grain yields in the baseline period for Sillampää's study were abysmally low. Thus the increase in wheat yield from the base period to the end of Sillampää's study was undoubtedly the effect of a combination of improvements, not just increased use of fertilizer.

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[33] CIA, "The impact of fertilizer * * *," p. 15; the same information was repeated by D.B. Diamond and W. L. Davis, "Comparative growth in output and productivity in U.S. and U.S.S.R. agriculture," pp. 19–54 in: Soviet Economy in a Time of Change, op. cit.

[34] Lydolph, critique of CIA's "The impact of fertilizer * * *", op. cit.

[35] Mikko Sillampää, A Study on the Response of Wheat to Fertilizers, Soils Bulletin No. 12, FAOUN, Rome, 1971.

[36] Ibid, p. 114.

[37] Ibid, Fig. 37, p. 116.

For both periods, the Soviets were somewhat below the regression curve for yield as a function of fertilizer application. The fact that the Soviets were below world averages (as fit by the regression) may have been due to climatic factors, unfavorable natural resource base or less than optimal agricultural practices.

Because the Sillampää study is quite out of date, Soviet fertilizer consumption having tripled since its completion, we attempted to replicate it using more recent data from the FAO. We began with the same 44 countries used in the original study, although it is unclear why these 44 were chosen, some being rather minor wheat producers. Of these 44, three were excluded due to inconsistencies in the data, leaving the 41 countries listed in Figure 1. The most recent year for our update was 1976, since after this year the FAO changed its reporting procedure to include ground rock phosphate in the total fertilizer figure, making data from 1977 and on not comparable to the earlier data. Data on wheat yield (kg/ha) and fertilizer applied per hectare of arable land ($N+P_2O_5+K_2O$) were thus collected for 41 countries for the period 1964 to 1976 from FAO publications.[38] From these data we updated the Sillampää study by calculating the average yield obtained and fertilizer used for the most recent 5-year period (1972–1976) for each country, and fit the same regression equation as did Sillampää. The results are shown in Figure 1 and Table V. As in the earlier study, the USSR is at the low end of the curve (low yield and low fertilizer use), this time somewhat below the curve (lower yield than predicted for that level of fertilizer application).

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[38] FAO Production Yearbook and FAO Fertilizer Yearbook, Rome (various issues).

Figure 1. National wheat yields and fertilizer use, 1972-1976. Alphabetical letters denote countries as follows:

b=S. Africa
c=Zambia
e=Guatemala
f=United States
g=Chile, Kenya, Canada
h=Colombia
i=Peru
j=Uruguay
k=China
l=Cyprus
m=Israel
n=Japan
o=Rep. Korea
p=Lebanon
q=Austria
r=Bulgaria
s=Czechoslovakia
t=Denmark
u=Finland
v=France

w=German Dem. Rep.
x=Fed. Rep. Germany
y=Greece
z=Hungary
A=Ireland
B=Italy
C=Netherlands
D=Norway
E=Poland
F=Portugal
G=Romania
H=Spain
I=Sweden
J=Switzerland
K=United Kingdom
L=Yugoslavia
M=Australia
N=New Zealand
O=Soviet Union

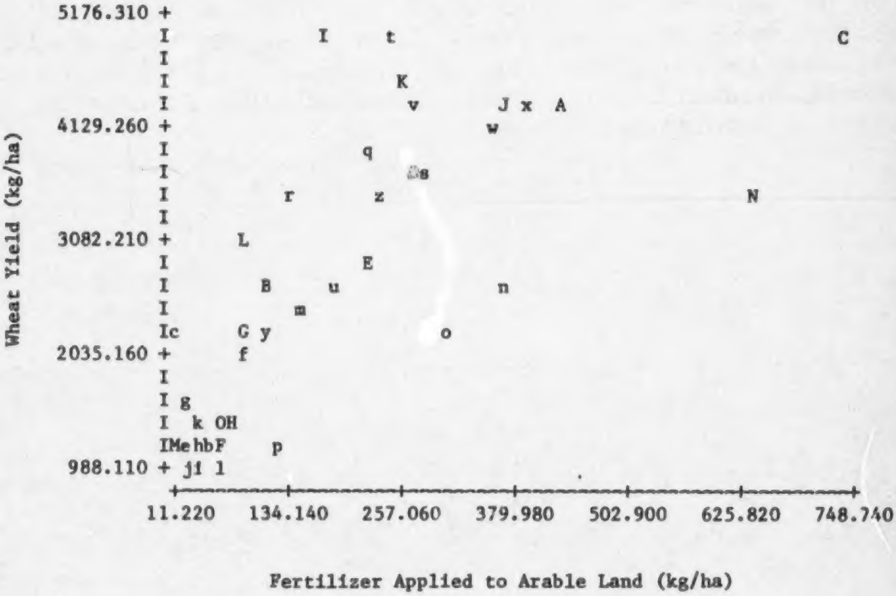

TABLE V.—REGRESSION EQUATIONS FOR YIELD AS A FUNCTION OF FERTILIZER USE

	a	b	c	R^2	Predicted yield for USSR 1972-76 (kilogram per hectare)
Sillampaa's functional form: $\ln(\text{yield}) = a + b \ln(\text{fertilizer}) + c (\ln(\text{fertilizer}))^2$:					
(A) Sillampaa, 1962-66 (converted from base 10 to base e)	7.1339	−0.2059	0.0645	0.64	1,599
(B) Update, 1972-76	7.593	−.3953	.08613	.65	1,674
(C) Alternative equation: $\ln(\text{yield}) = a + b \ln(\text{fertilizer})$	5.835	.4032		.62	1,794

The coefficients of the regression equation changed somewhat in the update (Table V), moving the entire curve somewhat higher (i.e. a higher yield predicted for a given level of fertilizer use). Because the functional form of this equation has little apparent basis in agronomic or economic theory, and because it behaves strangely at very low levels of fertilizer use (predicting higher yields for less fertilizer application), an alternative, simpler function expressing constant marginal response rate was also fit (Table V, equation C). This equation, as fit to 1972-1976 data, is somewhat flatter, predicting higher yields at lower levels of fertilizer application than Sillampää's equation (A or B) but predicting lower yields at higher levels. All three equations predict considerably higher levels of yield for the USSR at its 1972-1976 fertilizer application level than the 1396 kg/ha actually achieved.

We also updated Sillampää's response rate analysis, in which the change in average yield between two time periods is divided by the change in average fertilizer use between the same two periods. For the update period 1972-1976 compared to 1964-1968, the Soviet response rate was 6.16 kg wheat per kg fertilizer.[39] In our update, in contrast to Sillampää's study, the USSR was below the regression line fitted to all countries for response ratio as a function of fertilizer use.[40]

The FAO recently completed a similar study in which the response of grains, rather than wheat alone, was analyzed.[41] Their graph of grain yield as a function of fertilizer use shows the USSR in the same position as for wheat yield: at the low end of the curve, somewhat below the fitted response curve. A response rate of "around 10" kg grain per kg fertilizer (nutrient units) is suggested as a reasonable figure across a variety of countries.[42] The focus of this publication is mainly on the Third World, and no specific figure is given for the Soviet Union.

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[39] Because the year-to-year variability in Soviet grain yield is so great, we also calculated the updated response rate for 1971-1976 compared to 1964-1968 (i.e. a year earlier for the second period, as if we had done the study before the last year of data was available) and around a 4-year interval rather than a 5-year interval (1973-1976 and 1964-1967); the response ratios were 6.75 and 6.32 respectively.

[40] Details of this unpublished analysis are available from J. S. Auburn.

[41] Crop Production Levels and Fertilizer Use, FAO Fertilizer and Plant Nutrition Bulletin, Rome, 1981.

[42] Ibid., p. 25.

ESTIMATES BASED ON NUTRIENT ANALYSIS

Yet another way to estimate the yield/fertilizer relationship is to look at the components of fertilizer as they appear in the plant. The N, P, and K embodied in grain (and in straw, if it is not returned to the soil) represent the minimum amount of these nutrients that must be added to the soil in some form (by man or other agent) unless the soil is to be depleted of its nutrients and thus its productive capacity. As such, they can form the basis of an estimate of an upper bound on response rate.

Table VI shows estimates from several sources of the nutrient content of grain and straw, per kg of grain harvested, for wheat and barley, the two major grains grown in the USSR. These figures vary somewhat as a function of grain variety and growing conditions, but these estimates are sufficient to suggest the order of magnitude of the relationship between nutrient content and grain mass. The ratio of grain mass to total nutrient mass ($N + P_2O_5 + K_2O$) is on the order of 15:1. This figure suggests an upper bound on the fertilizer response rate: if all fertilizer applied were incorporated into plant tissue, approximately 15 kg grain would be produced for each kg of fertilizer. Of course, not all fertilizer applied in a given year may be taken up by the grain plant; except for that lost to leaching, denitrification, etc., however material not taken up in one year is available for the next year's crop.

TABLE VI.—PRIMARY NUTRIENTS EMBODIED IN WHEAT AND BARLEY

[Kilogram in grain and straw, per kilogram grain]

Source	N	P_2O_5	K_2O	Total	1/total
Wheat:					
Sillampaa	0.0261	0.0150	0.0206	0.0617	16.21
FAO	.0280	.0120	.0260	.0660	15.15
Appendix A	.0277	.0084	.0275	.0636	15.72
Barley:					
Sillampaa	.0255	.0105	.0236	.0596	16.78
Appendix A	.0258	.0073	.0383	.0714	14.01

The ratio of grain yield to the single nutrient N is on the order of 36–39 kg grain per kg N. This figure suggests an upper limit to the response to nitrogenous fertilizer, a key element of interest in this paper due to its importance in grain production as well as to its manufacture from natural gas. Of course, this limit will not be achieved in the absence of a balance of inputs (other nutrients, water, pest control, etc.).

The nutrient analysis approach is also useful for examining the total amount of N, P and K removed by a given year's grain crop relative to the amount replaced by fertilizers and other inputs. While it is impossible to account for some unknown sources of input or outflow (e.g. fertilizer carried over from a crop other than grain the previous year, manure applied, leaching, etc.), an overall look at the aggregate nutrient balance for the major grains can indicate whether or not the Soviets are nearing the upper range of useful fertilizer application, as the proponents of the diminishing returns argument suggest.

The appendix details the methodology behind the nutrient balance analysis. The results of this analysis, summarized in Table VII, show that unless it is assumed that the straw fraction of each crop is fully returned to the soil (an unlikely assumption), more nutrients are removed than replaced with fertilizer in most years. This deficit occurs even when it is assumed that all straw is returned to the soil, in years of particularly high yield. The deficit is much worse, of course, for the large grain areas that receive no fertilizer in a given year (43 percent in 1980, see Table IV). If the Soviets are not even replacing with fertilizer what they are taking away in grain or straw, additional fertilizer application should result in a considerable yield increase.

TABLE VII.—NUTRIENTS REMOVED PER HECTARE, NET OF SEED, RAIN AND BACTERIAL FIXATION (SEE APPENDIX)

Year	Wheat—		Barley—		Fertilizer added to grain (kilogram per hectare)
	Straw harvested	Straw left	Straw harvested	Straw left	
1975	54.8	25.8	65.2	23.4	42
1976	89.1	45.0	129.2	51.9	47
1977	79.9	39.8	94.8	36.6	48
1978	106.9	54.9	120.3	47.9	51
1979	84.8	42.6	76.3	28.3	49

SUMMARY: GRAIN RESPONSE TO FERTILIZER APPLICATION

As discussed in each section above, there are limitations and uncertainties surrounding any single methodology for estimating the response of Soviet grain yield to fertilizer application. Taken as a whole, however, the various approaches allow us to put some bounds on the range of likely values. Table VIII summarizes the results of the various approaches presented above. The response rate ranges from a low of 5.4 kg grain per kg fertilizer (the lowest of the CIA figures) to a high of 17 kg grain per kg fertilizer (the highest of the nutrient analysis figures). A very conservative conclusion from these figures is that a response rate of 7 kg grain per kg fertilizer nutrients can be expected for the Soviet Union. The response rate will, of course, be affected in any given year by a number of factors, especially other technological inputs and weather. Over the long term, however, this response rate should be realized as long as an adequately balanced set of technological inputs is applied along with the fertilizer.

TABLE VIII.—SUMMARY OF ESTIMATES OF RESPONSE RATE (KILOGRAM GRAIN PER KILOGRAM FERTILIZER)

Source	Response rate	Notes
Soviet statistics:		
Clayton	7.7	Grain, by extrapolation from total ag. output.
CIA, table 4	5.4–5.8	Grain.
CIA, table 2	7.6	Winter wheat and rye (and extrapolated to all grain by CIA).

TABLE VIII.—SUMMARY OF ESTIMATES OF RESPONSE RATE (KILOGRAM GRAIN PER KILOGRAM FERTILIZER)—Continued

Source	Response rate	Notes
Comparative approach:		
Sillampaa	14.7	Wheat, based on fertilizer applied to arable land.
Appendix	6.2–6.8	Wheat, as for Sillampaa.
FAO	10	Grain, world average.
Nutrient analysis:		
Wheat	15–16	Theoretical maximum.
Barley	14–17	Theoretical maximum.

FERTILIZER PRODUCTION

The three approaches discussed in the previous sections were designed to estimate the likely grain output at given levels of fertilizer input. In this section, we turn to an analysis of whether the Soviets are able to meet the needed fertilizer production requirements for nitrogen, potash, and phosphates.

NITROGEN, PHOSPHATES AND POTASH

Only with the ouster of Lysenko in the early 1960's, did the Soviet Union emphasize the rapid expansion of its fertilizer industry. Despite rigorous Soviet official plans to expand fertilizer production, the actual performance of fertilizer output has repeatedly fallen far short of its planned growth, as illustrated in Table IX. Huge increases in fertilizer output were planned by both Khrushchev and his successor only to have the targets continuously revised downward. For example, the initial plan goal for 1980 fertilizer production targeted 143.0 million metric tons (mmt). This was later revised downward to 115.0 mmt.[43] According to the USDA, "the Soviet production of chemical fertilizers in 1979 fell to 94.5 million tons, about 4 percent below 1978 levels.[44] This is illustrated in Table X where monthly and cumulative mineral fertilizer production figures are given for 1973 to 1980.[45] Brezhnev, in his recent report to the CPSU Central Committee's Plenary Meeting,[46] also strongly alluded to the shortages of mineral fertilizers and herbicides, and the losses due to storage and ineffective utilization of fertilizers.

TABLE IX.—PLANNED SOVIET GROWTH IN PRODUCTION OF FERTILIZERS, AND ACTUAL OUTPUT AS REPORTED BY THE FAOUN; CIA AND USDA FROM 1964 TO 1980

[Standard units (million metric tons)]

Year	Soviet planning goals	Actual output		
		FAOUN [1]	CIA [1]	USDA [2]
1964	[3] 25.5	22.3	25.5	(4)
1965	[3] 35.0	27.5	31.3	(4)

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[43] USDA, "The U.S. Sales Suspension . . .", op. cit., p. 22, 47.

[44] Ibid., p. 22.

[45] Young, op. cit., p. 173–176.

[46] Brezhnev, op. cit., p. 2.

TABLE IX.—PLANNED SOVIET GROWTH IN PRODUCTION OF FERTILIZERS, AND ACTUAL OUTPUT AS REPORTED BY THE FAOUN; CIA AND USDA FROM 1964 TO 1980—Continued

[Standard units (million metric tons)]

Year	Soviet planning goals	Actual output		
		FAOUN [1]	CIA [1]	USDA [2]
1966	[3] 39.2	31.3	35.8	(4)
1967	[3] 46.0	35.2	40.1	(4)
1968	[3] 55.0	43.5	43.4	(4)
1969	[3] 64.7	46.0	45.8	(4)
1970	[5] 70.0–80.0	55.2	55.4	(4)
1971	(4)	(4)	(4)	61,4
1972	[6] 95.0	71.2	66.1	66.1
1973	(4)	(4)	(4)	72,3
1974	(4)	(4)	(4)	80,4
1975	[7] 90.0	88.0	90.2	90.2
1976	(4)	(4)	(4)	92.2
1977	(4)	94.0	(4)	96.8
1978	(4)	95.8	(4)	98.0
1979	[8] 111.0	(4)	(4)	94.5
1980	[9] 115.0	(4)	(4)	(4)

[1] Figures taken from Young, op. cit., p. 169–172.

[2] Figures taken from USDA, the U.S. sales suspension. . . . op. cit., p. 47.

[3] Goals of the Seven Year Plan (1959–65), and later adjustments announced by Mr. Khrushchev in his speech to the Plenum of the Central Committee, Dec. 9, 1963 (FAOUN. 1965, p. 53).

[4] Not available.

[5] Revised to 62.65 by Mr. Brezhnev in the Five-Year Plan (1966–70). In December 1969, this figure was further revised downward to 57.5 million tons (Nove, Alec, "Soviet Agriculture Under Brezhnev, Slavic Review, Vol. 29, No. 3, Sept. 1970, p. 405).

[6] Decree of the Central Committee-Council of Ministers, May/June 1968 (Hahn, Werner G., The Politics of Soviet Agriculture, 1960–70, The John Hopkins University Press, 1972, p. 197.

[7] Five-Year Plan (1971–75), announced July 1970 (Hahn op. cit., p. 244).

[8] USDA, The U.S. Sales Suspension and Soviet Agriculture, Supplement 1 to WAS–23; Economics and Statistics Service, (1981), p. 22.

[9] Ibid., p. 47

According to the CIA, the Five-Year Plan envisioned 143.0 million metric tons for 1980 (cited in CIA-The Impact of Fertilizer on Soviet Grain Output, 1960–80, (1977), p. 17.

TABLE X.—U.S.S.R.: MINERAL FERTILIZER PRODUCTION, MONTHLY AND CUMULATIVE, 1973 TO 1980

[In Millions of metric tons]

Year	January	February	March	April	May	June	July	August	September	October	November	December
1973:												
Monthly	5.9	5.5	6.0	5.9	6.2	6.8	5.9	6.2	5.9	6.2	6.3	6.5
Cumulative		11.5	17.5	23.4	29.6	35.4	41.3	47.4	53.3	59.5	65.8	72.3
1974:												
Monthly	6.4	6.0	6.7	6.5	6.8	6.6	6.4	6.8	6.5	7.0	7.1	7.5
Cumulative		12.4	19.1	25.6	32.4	39.0	45.4	52.1	58.7	65.7	72.8	80.3
1975:												
Monthly	7.4	6.9	7.5	7.2	7.5	7.4	7.1	7.5	7.4	7.8	8.0	8.5
Cumulative		14.3	21.8	29.0	36.6	44.0	51.1	58.6	66.0	73.7	81.7	90.5
1976:												
Monthly	7.6	7.0	7.8	7.6	8.0	7.8	7.4	7.8	7.3	7.9	8.0	8.2
Cumulative		14.5	22.3	29.9	37.8	45.6	53.0	60.8	68.1	76.0	84.0	92.2
1977:												
Monthly	8.1	7.4	8.3	8.1	8.2	8.0	7.7	7.4	8.5	7.9	8.4	8.6
Cumulative		15.5	23.8	32.0	40.2	48.2	55.9	63.3	71.8	79.5	88.3	96.7
1978:												
Monthly	8.6	7.8	8.7	8.4	8.7	8.2	7.8	8.3	7.5	7.9	8.2	8.1
Cumulative		16.4	25.1	33.5	42.1	50.3	58.1	66.5	74.0	81.9	90.1	98.0
1979:												
Monthly	6.5	6.6	8.6	8.4	8.8	8.5	8.2	8.0	7.5	7.5	7.6	8.4
Cumulative		13.1	21.7	30.1	38.9	47.4	55.6	63.6	71.1	78.5	86.1	94.5
1980:												
Monthly	8.9	8.4	9.0	8.9	9.3	8.7	8.5	8.8	8.4			
Cumulative		17.3	26.3	35.2	44.5	53.2	61.7	70.4	78.8			

Source: Ekonomicheskaya Gazeta, 1973–80 weekly issues. USDA, "The U.S. Sales Suspension and Soviet Agriculture." An October Assessment, Supplement 1 to WAS–23 (1981) p. 49.

In 1979, the Soviet Union increased its fertilizer plant capacity considerably. In that year, "the Soviets added 15.8 million tons of new production capacity, up sharply over the 3 and 4 million ton additions in 1977 and 1978." [47] The added plant capacity particularly in ammonia was the result of a 1973 agreement with Occidental Petroleum spanning 20 years where the latter agreed to build ammonia plants in the USSR and to import anhydrous ammonia into the United States. At the same time, the US would export superphosphates to the USSR.

"These exports, which had been nil in 1978, increased to 543,000 short tons in 1979, (and) were expected to amount to 1 million tons annually between 1980 and 1997 had they not been brought under the validated export licensing procedure in February 1980. Since then, export licenses for superphosphoric acid destined for the USSR have been systematically denied by the United States." [48]

In 1978, Soviet ammonia exports increased by 193 percent from 1977 (see Table XI), rivaling the number one world export nation of ammonia, the Netherlands with 572,000 metric tons nitrogen in 1978.[49] From these data one can speculate that the Soviet Union adheres to a policy of high ammonia exports, and any production shortfalls are suffered in deliveries to agriculture and not in the export sector.

TABLE XI.—*Soviet ammonia exports (nutrient weight)*

	(1000 mt N)
1975	71.8
1976	133.9
1977	142.9
1978	561.5

Source: FAOUN Fertilizer Yearbook (1979), p. 70.

In terms of phosphate resources the Soviets find themselves in an uncertain situation over the long term. While a present world glut of phosphates has momentarily ameliorated the Soviet shortages suffered immediately after the 1980 US embargo of superphosphates destined to that country, the reasons for the glut are rather short-term (low fertilizer demand due to a world economic weakness, as well as present ample world food supplies).[50] The current abundance of superphosphate supplies does not change the overall Soviet phosphate situation. Large areas of Soviet agricultural lands are lacking in phosphoric nutrients [51] and while the Soviets hold 4% of the world's phosphate reserves,[52] the phosphate ore is of a low grade and consequently is more difficult and expensive to mine and process.[53] In 1980 the USDA presented a rather bleak picture of the Soviet phosphate situation in light of the embargo of U.S. superphosphate shipments, speculating that, "the use of merchant grade material to replace the (superphosphate fertilizer) from the United States would necessitate a major new investment in conversion of plants now designed for (superphosphate fertilizer), and would take 1 to 2 years to complete. In the meantime, the Soviets would be unable to meet their liquid fertilizer production goals."[54]

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[47] USDA, "The U.S. Sales Suspension . . .", op. cit., p. 22.
[48] Ibid., p. 22–23.
[49] Fertilizer Yearbook, FAOUN, 1979, p. 70.
[50] Personal communicaiton from Warren Sharratt, Tennessee Valley Authority, May, 1982.
[51] USDA, "The U.S. Sales Suspension . . .", op. cit., p. 23.
[52] USDA, "World fertilizer review and prospects to 1980/1981," Foreign Ag. Econ. Report No. 115, February 1976, p. 27.
[53] Personal communication from Ed Harre, Tennessee Valley Authority, May, 1982.

The Soviet concern over adequate high-grade phosphate supply is not merely recent. In 1975 the USSR negotiated with Morocco to develop a large mine in the Meskala region and port facilities in return for phosphate rock supplies. Also during November 1980, the Soviet Union signed a contract with two Belgian chemical companies to supply 70,000 tons of superphosphate fertilizer annually for five years.[55] Partly in response to the US embargo of superphosphates, the chairman of Occidental Petroleum announced in October 1980 that the company is negotiating with France to build a superphosphate plant on French soil with an annual capacity of 450,000 tons.[56] This fertilizer is intended primarily for sale outside of France, but not solely for Soviet consumption. At this point, it is difficult to assess the exact phosphate situation in the Soviet Union.

And finally, the resource base for the production of the third major nutrient (potash) is quite adequate. The USSR possesses an estimated 7 percent of the world potash reserves and continues to be the world's leading producer of potash.

AMMONIA FROM NATURAL GAS

Most interesting from the standpoint of agriculture/energy sector linkages is ammonia fertilizer, which is manufactured (in the USSR as well as in the US) primarily from natural gas. Ammonia is not the only nitrogen fertilizer, of course, but it is generally the starting point in the production of other nitrogen fertilizers. Since 95 percent of the nitrogen fertilizer in the Soviet Union is made from natural gas, the gas/fertilizer relationship is pivotal no matter what particular form of nitrogen fertilizer is being discussed. In this study, reference to ammonia is to anhydrous ammonia (NH_3, 82% N by weight) unless otherwise stated. Most often our figures are presented in terms of weight of N rather than of NH_3, since N is the component that is important in crop production.

Historical and projected Soviet ammonia capacity, as estimated by the Tennessee Valley Authority, is shown in Table XII. These estimates are conservative compared to other sources.[57] Roughly half of Soviet ammonia capacity represents recently-installed Western plants.[58] There have been delays bringing these plants on line (for example, the Tolyatti plant that was to have started production in 1980 and is just now (1982) starting first production)[59]; the revised TVA estimates in Table XII take these delays into account and should be achieved. If so, ammonia capacity will have increased 35 percent from 1980 to 1985. If all of this capacity were to be utilized (capacity utilization is usually on the order of 75–85 percent,[60] the natural gas required for this ammonia production would be as shown in Table XII, with a maximum requirement of roughly 33 billion cubic meters (BCM) in 1985.

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[54] USDA, "The U.S. Sales Suspension . . .," op. cit., p. 23.

[55] The Economist, October 25–31, 1980, p. 99.

[56] Ibid., p. 98.

[57] Hanson, Trade and Technology . . . ., op. cit., p. 172.

[58] Ibid., p. 172–3.

[59] Ed Harre, TVA, personal communication.

[60] Capicity utilization is estimated by Hanson (Soviet Strategies . . ., op. cit., p. 172) to be 75 percent; Ed Harre, TVA, estimates 80–85% (personal communication).

TABLE XII.—AMMONIA CAPACITY AND NATURAL GAS EQUIVALENT

Year	Ammonia capacity (mmt N)	Natural gas equivalent (BCM)
1975	10.364	13.7427
1976	11.434	15.16
1977	12.644	16.7659
1978	14.232	18.8716
1979	16.452	21.8154
1980	19.421	25.7522
Updated [1]	(18.43)	(24.4382)
1981	20.901	27.7147
Updated [1]	(18.8)	(24.9288)
1982	24.733	32.796
Updated [1]	(20.65)	(27.3819)
1983	24.733	32.796
Updated [1]	(22.13)	(29.3444)
1984	24.733	32.796
Updated [1]	(24.00)	(31.8240)
1985	24.733	32.796
Updated [1]	(24.70)	(32.7522)

[1] Figures in parenthesis were updated in May 1982, by Ed Harre, TVA, in a personal communication.

Note.—Ammonia figures were converted to natural gas equivalents as follows: mmt N * 1.1025 short ton/metric ton * 1.214 ton NH_3/ton N * 35,000 ft^3 gas/ton NH_3. * 0.0283 m^3/ft^3 = million cubic meters gas equivalent.

Source: For ammonia, International Fertilizer Development Center and Tennessee Valley Authority, Technical Bulletin IFDC-T-13, March 1979. Figures from 1978 onward are forecasts.

The natural gas future of the USSR has been described most completely by Stern.[61] Briefly, the Soviets have the largest share of the world's proven reserves (34%, as compared to less than 10% for North America) and, while experiencing an eastward shift of the center of gas production that will undoubtedly make both production and transportation more difficult and costly, have actually exceeded planned levels of production since the late 1970's. While future production will depend heavily on the development of sufficient infrastructure (such as large-diameter pipelines for transportation), estimates of 1985 production range from 560 to 750 BCM, with 55–180 BCM available for export.[62] Thus natural gas that might be converted to ammonia in 1985 represents a small fraction of total gas production, on the order of 4 to 5 percent. Limits to production of natural gas should therefore not constrain ammonia production in the near future.

Transportation of natural gas is, however, a more limiting factor. As gas production moved eastward, the average pipeline distance for natural gas in the Soviet Union more than tripled in the last two decades.[63] According to Stern, ". . . if the Soviets could really make a breakthrough in gas transportation it could make a great deal of difference in the volume of gas that could be produced in the near to medium term." [64] More efficient gas transport can be effected through such measures as larger diameter pipe, higher pressures, and/or lower temperatures. These improved pipelines require advanced technology, much of which is related to imports from the West. In terms of quantity as well, domestic Soviet pipeline production is inadequate for the greatly increased amounts of natural gas that the Soviets plan to move from Western Siberia to the east. The current "most effective present type of pipeline" (56-inch pipe, 75 atmospheres pressures, carrying 30–32 BCM gas per year and costing $3.5–4.3 billion) requires a year's output of Soviet pipe for just one span of this distance,[65] and one line of this diameter is insufficient for the volume of gas to be transported.

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[61] Jonathan P. Stern, Soviet Natural Gas Development to 1990, Lexington Books (D.C. Heath), Lexington, Mass, 1980; Jonathan P. Stern, in Energy in Soviet Policy, U.S. Congress Joint Economic Committee Print, June 11, 1981.

[62] Stern, 1981, op. cit., p. 34

[63] Ibid., p. 38–39.

[64] Ibid., p. 43.

It may be that problems in natural gas distribution are responsible for some of the shortfalls in fertilizer production 1979 due to feedstock delivery problems as mentioned by the USDA.[66] Hanson [67] notes Brezhnev's complaint at the November in 1979 Plenum of a shortage of gas feedstocks for fertilizer production, but the reason for the shortage is not pinpointed.

Ammonia (in liquified form) can similarly be transported by pipeline. The 2130-km ammonia pipeline from Tolyatti to Odessa, completed in late 1980, is of fairly small diameter (up to 355.6 mm) compared to major gas lines, and can carry 4 million tons of liquid ammonia, 1.5 million tons of carbamide, and one million tons of superphosphoric acid.[68] It reportedly cost $301 million.[69] It is futile to try to compare these figures to costs for gas pipelines without knowing such factors as costs of producing fertilizer in more distant (eastern) locations, operating costs of each kind of pipeline, etc. But if large-diameter pipe is a major constraint on natural gas production, conversion to ammonia closer to the source of production, followed by ammonia transport in smaller pipelines, might be a way to effectively increase both fertilizer and gas production. As noted above, however, the amount of natural gas that is likely to be converted to ammonia is rather small compared to total production. Thus this sort of a process will not greatly effect the efficiency of gas production.

Compared to likely natural gas export levels, however, the amount of gas that might be converted to ammonia is significant: the 33 BCM that it will be possible for the Soviets to convert to ammonia in 1985 is 18–60 percent as great as the likely 55–180 BCM of gas available for export. If one of these products is seen to be more valuable (economically or strategically), it may be that they will compete for residual natural gas, capital investment, etc. The additional possibility that fertilizer might be used domestically rather than exported adds another dimension to the picture. Given an amount of natual gas, then, what are the relationships between the various production and trade options?

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[65] Theodore Shabad, News Notes, Soviet Geography, 23(2):121, (1982).
[66] USDA, "Agricultural Situation. . . , op. cit., p. 15.
[67] P. Hanson, Soviet Strategies . . ., op. cit.
[68] Petroleum Economist, January 1981, p. 36.
[69] Hanson, Trade and Technology . . ., op. cit., p. 175.

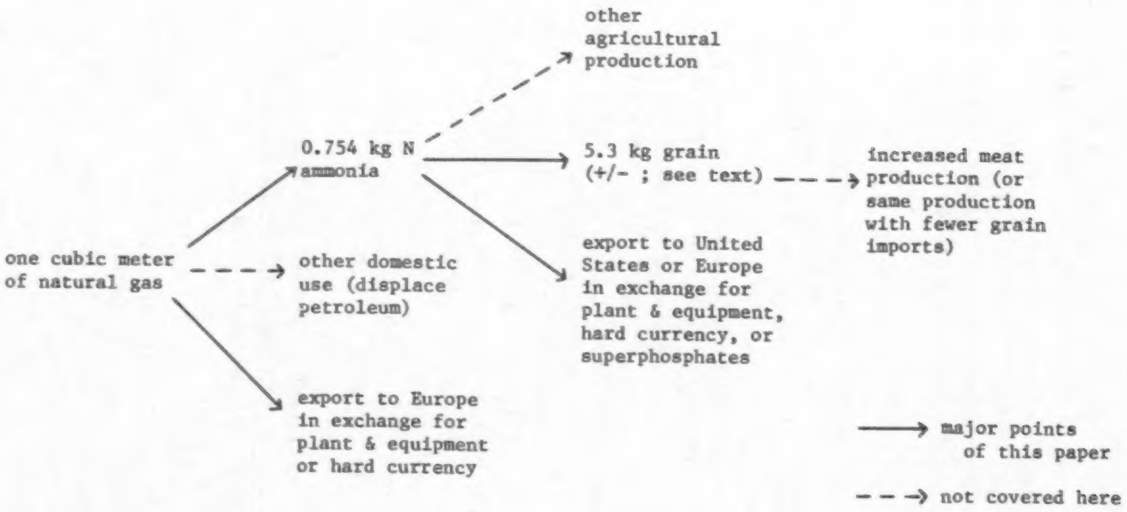
NATURAL GAS/AMMONIA/GRAIN PRODUCTION AND TRADE OPTIONS

As discussed at the outset of this paper, it is virtually impossible to spell out definitively the costs and benefits associated with each of the options to be discussed below, especially with the limited data available. Nevertheless, it is valuable to explore the physical conversion possibilities and some of their economic and political implications, in quantitative and qualitative terms.

PHYSICAL RELATIONSHIPS

Figure 2 shows some of the options available for the use of one cubic meter of natural gas. It can be exported for either foreign currency or as payment for Western technology in a product-payment arrangements, as is common in recent natural gas development projects, or it can be consumed domestically in either ammonia production or some other end use. It might displace oil in a domestic end use, freeing an equivalent amount of oil for export; oil is a more attractive export product than natural gas as it does not depend upon a fixed pipeline for transport and thus can be sold to a wider range of customers. If the cubic meter of gas is converted to ammonia, it becomes an estimated .754 kg N embodied in the ammonia (see notes to Table XII for the basis for this conversion). This ammonia can then be exported, again either for hard currency or on a product-payment or barter basis as in the Occidental Petroleum arrangement. Alternatively, the ammonia can be applied to domestic agricultural production. If it is applied to grain, it can displace some of the need for grain imports. If all cooperating inputs including infrastructure were available in the necessary proportions, .754 kg N could theoretically produce up to 27–29 kg grain, based on the nutrient analysis of 36–39 kg grain per kg N. This high a response rate would only be achieved if nitrogen were the sole limiting factor in plant growth, that is if all other inputs were presented in abundance (other nutrients, water, etc.), which is never the case in reality in any country. A much more conservative estimate of likely grain response to N input would be on the same order as that for total fertilizer input (7 kg grain per kg fertilizer), in which case .754 kg fertilizer would produce 5.3 kg grain. This estimate is probably on the low side since plant response is almost always greater to nitrogen fertilizer than to phosphates or potash. The response to nitrogen will vary as a function of factors such as soils, climate and technology.

Figure 2. Flowchart of some options for the end use of natural gas.


one cubic meter of natural gas
0.754 kg N ammonia
other domestic use (displace petroleum)
export to Europe in exchange for plant & equipment or hard currency
other agricultural production
5.3 kg grain (+/- ; see text)
export to United States or Europe in exchange for plant & equipment, hard currency, or superphosphates
increased meat production (or same production with fewer grain imports)
major points of this paper
not covered here

ECONOMIC RELATIONSHIPS

The above figures for the conversion of natural gas to fertilizer and then to grain are merely tenuous estimates. The analysis that follows could be repeated using other conversion rates. But accepting these estimates for the moment, we pose the following question. What is more valuable to the Soviets relative to its cost of production: one cubic meter of gas, .754 kg N fertilizer, or 5.3 kg grain? A look at U.S. and world prices for these three commodities can give an indication of their relative value in world trade, although of course it is absurd to assume that the Soviets value gas, fertilizer or grain solely according to its price in the international marketplace. Nonmonetary considerations will be discussed below. World prices for all three commodities are quite variable across time and across different countries. The figures here are presented solely to give a rough idea of their relative order of magnitude of value in international trade. Each particular trade transaction has its own terms of trade, of course, many of which are not revealed to the public.

With these cautions stated, then we look at gas, ammonia and grain prices at a given point in time. In mid-1979, U.S. ammonia producers paid, on average, $1.40 per thousand cubic feet for natural gas.[70] At this price, one cubic meter of gas is worth approximately five cents. United States prices are considerably lower than European, however; the Soviets are likely to get a much better price than this for their gas sales to Western Europe. Additionally, this U.S. average price includes many long-term contracts at lower rates and will thus rise considerably as these contracts expire and as natural gas prices trend upward.

At the same time in 1979, ammonia sold for $130 per metric ton ($NH_3$) f.o.b. U.S. gulf ports, or $145 in Europe,[71] so that .754 kg N was worth twelve or thirteen cents.[72] European prices for ammonia are generally higher than U.S. gulf prices, however, in part because much of European ammonia is made from petroleum-based naphtha rather than natural gas.[73] U.S. gulf ammonia sales and production prices are the lowest for the United States. California production costs, in contrast, are nearly double those of the gulf coast [74] and California sales prices for gulf coast ammonia are generally higher due to transportation costs.

At the 1979 price of $156.3 per metric ton for U.S. No. 1 soft red winter wheat,[75] 5.3 kg wheat is worth eighty-three cents. While the Soviet Union imports other grain besides this particular variety of wheat, this figure indicates the relative magnitude of grain prices.

From these prices for gas, ammonia and grain, it can be seen that the majority of the value added along the conversion process occurs when ammonia is converted to grain, rather than when gas is converted to ammonia. The production of grain from ammonia fertilizer requires many additional inputs, however, and is correspondingly more costly, especially in the Soviet Union which is at somewhat of a disadvantage in terms of climate relative to many areas of the United States. On strictly comparative advantage terms, it might appear that the Soviet Union should export natural gas, in which they clearly have the edge, or perhaps fertilizer (although they do not appear to have any advantage in this production process, relying so heavily on Western plant and processes), and continue to import considerable quantities of grain. But other considerations may override this narrow view, particularly when long-term as well as short-term implications are taken into account. Such additional considerations include the transportation infrastructure requirements, the hard currency gain or loss, and the strategic implications. Each of these considerations is discussed below.

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[70] Information supplied by California Assembly Agriculture Committee, see note 10.

[71] USDA, "1980 Fertlizer Situation," FS–10, December 1979, p. 23.

[72] $.13-.145/kg NH_3 times .754 kg N divided by .82 kg N/kg NH_3.

[73] USDA, "1980 Fertilizer Situation," op. cit.

[74] See note 69.

[75] Commodity Trade and Price Trends, distributed for the World Bank by John Hopkins Press, August 1981, p. 46.

TRANSPORTATION, HARD CURRENCY AND STRATEGIC ISSUES

The likely limitations on natural gas production and distribution imposed by transportation needs were discussed above. Large imports of grain present a transportation problem as well, in that Soviet port capacity is limiting. These infrastructure constraints are definitely limiting over the short-term but could be lifted over the long-term, if the necessary investments are made. If they continue to exist, they would weigh against the comparative advantage option of exporting gas and importing grain.

The fact that considerable value is added to fertilizer when it is used to produce grain means that grain imports, which normally must be paid for in hard currency, are even more costly relative to fertilizer and gas than their simple prices suggest. Domestically produced grain is therefore correspondingly more valuable to the extent that the inputs used to produce it are not hard currency drains. If inputs to grain production could alternatively be sold for foreign currency (e.g. fertilizer, machinery), though, there is an indirect hard currency cost to producing grain domestically. But as long as these potential hard currency generators are small relative to all inputs to grain production, it would seem that domestic grain production, as opposed to sales of agricultural inputs and purchase of grain, would be more attractive from the balance of trade standpoint.

The strategic implications of grain imports also favor domestic production. In his recent food program speech, Brezhnev discussed this issue:

> The participants in the Plenary Meeting of the CPSU Central Committee are aware that in recent years, especially because of crop failures, we were compelled to purchase grain, meat and a number of other foodstuffs abroad. This has been done in the interests of the people. In future as well we have no intention at all of giving up what foreign trade can offer as regards replenishing the resources of food, naturally, with due regard for economic feasibility. It is quite logical, therefore, that the Draft of the Programme envisages cooperation with foreign countries, above all, socialist countries.
>
> The Draft proceeds from the need to reduce import of foodstuffs from capitalist countries. The interests of the country demand that we should have adequate food and fodder resources of our own, which would put us beyond the reach of chance. At the same time, as you know, the leadership of certain states is striving to turn ordinary commercial operations, such, for example, as grain sales, into a means of put-

> ting pressure on our country, into an instrument of political pressure. We have never put up with that, nor are we going to do so.[76]

Soviet natural gas exports to Western Europe raise strategic concerns for the United States government, although analysts differ over the justifiability of this concern.[77] Likewise, Soviet ammonia sales to the U.S. have prompted consideration of protective measures at both Federal and State levels.[78]

SHORT-TERM VS. LONG-TERM CONSIDERATIONS

All of the above factors must be considered in light of their long-term as well as short-term implications. As pointed out above, the transportation infrastructure for gas exports and grain imports is a current constraint, but not a long-term one given sufficient investment. Investment needs of the energy sector, however, may compete with investment in agriculture, in both the short and long terms. Trade balance issues enter into the investment trade-off as well: much of the growth in investment in the enegy sector is required to maintain oil exports, which in turn finance grain imports. Maintenance of oil exports would not be so crucial if domestic grain production were increased.

The hard currency aspect of gas and fertilizer exports is more favorable in the long run, since current product-payback or barter arrangements will later become hard currency earners. Product-payback and barter trade has allowed the Soviets to make investments in future production by purchasing Western equipment without incurring hard currency costs. The use of Western technology is a sacrifice in the long term, however, if it leads to the neglect of their domestic technological base.[79]

Grain imports are clearly acceptable to the Soviets as a short-term expedient, but as they enter what may be a fourth year of disappointing grain harvests, the repeated need for imports may convince them that they must turn around what is looking more and more like a long-term reliance on grain imports. The Soviets often have responded to a series of poor crop years with increased investment in agriculture.[80] These investment spurts have ususally been short-term fixes, however. The most commonly cited example of this phenomenon is Khrushchev's New Lands program. Brezhnev, in spite of his talk of intensifying and stabilizing agriculture, has continued his predecessor's short-sighted policies in his failure to invest in agricultural infrastructure. Stating that the benefits of new agricultural equipment would take to long too materialize, he commissioned the aviation industry to produce equipment for the poultry industry, the defense industry to provide tractors and fertilizer spreaders, and the shipbuilding sector to produce sprinkler system.[81]

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[76] Brezhnev, op. cit., p. 3.

[77] See note 5 for U.S. concerns; Stern, Soviet Natural Gas . . ., op. cit., Chapter 14, discusses why Europeans are less alarmed.

[78] See note 10.

[79] Hanson, Soviet Strategies . . . ., op. cit.

[80] Young, op cit, Chapter IV.

[81] Werner G. Hahn, The Politics of Soviet Agriculture, 1960–1970. Johns Hopkins University Press, Baltimore, p. 246.

Historically, Soviet agriculture has never received the investment priority that it warrants. The strongest evidence that this situation might now change is Brezhnev's speech before the CPSU Central Committee's Plenary Meeting, which equals in importance the March 1965 Plenary Meeting which "formed the basis of the present-day agrarian policy of the Party.[82]" The content of this speech, stressing the need to build up agricultural infrastructure, suggests that the Soviets may finally be willing to make the long-term investments necessary to improve grain output. A long-term investment strategy might not result in immediate gains, but it would set the stage for more consistent and predictable grain production in the future. While it is prudent to recognize the weaknesses of Soviet agriculture, it is equally prudent to recognize its strengths and not to extrapolate future grain production capacity solely on the basis of past performance.

APPENDIX: NUTRIENT ANALYSIS FOR WHEAT AND BARLEY

To calculate the nutrients embodied in both grain and straw components of wheat and barley, figures were taken from Orphanos & Krentos's analysis of N, P and K content as a function of level of fertilizer applied.[83] From their Tables 2 and 4, we calculated the mean of the two figures given for the two lowest levels of fertilization (0 and 35 kg N per ha), since current Soviet N application to grain lies between these two figures. Our calculated values, as a percent of dry weight, are:

	N	P	K
Wheat, grain	2.12	0.31	0.495
Wheat, straw	.43	.039	1.19
Barley, grain	1.86	.27	.495
Barley, straw	.48	.031	1.79

These figures may not be exactly those of Soviet varieties, of course, but should be representative. Based upon an estimated 60:40 ratio of straw dry matter to grain dry matter,[84] and then conversion from P and K to P_2O_5 and K_2O (P_2O_5 is 43.64% P; K_2O is 83.02% K), the figures in Table VI were derived.

For Table VII, the per kg figures were multiplied by the Soviet barley and wheat yields for a given year (source: note 1). Then, nutrient inputs in the form of seed (at a seeding rate of 100 lb/acre [85] or 112 kg/ha) and nitrogen added by rain and bacterial fixation (7 kg/ha, based on) [86] were subtracted to arrive at net nutrient removal. Several unmeasurable inputs (e.g. manure) and losses (e.g. leaching, denitrification) were of necessity ignored.

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[82] Brezhnev, op. cit.

[83] P. I. Orphanos and V. D. Krentos, "Concentration of N, P and K in leaves, straw and grain of wheat and barley as influenced by N and P fertilizers under semi-arid conditions," J. Agric. Sci., Cambridge, 94:551–556, 1980.

[84] Robert Loomis, Agronomy Dept., and Lee Jackson, Agronomy Extension, Univ. Calif., Davis, personal communications.

[85] L. Jackson, pers. comm.

[86] R. Loomis, pers. comm.

SUBSIDIES IN SOVIET AGRICULTURE: RECORD AND PROSPECTS

By Vladimir G. Treml*

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SUMMARY

State subsidies to agriculture in the USSR rose from about 17 billion rubles in 1970 to over 37 billion in 1980, more than doubling in a decade and reaching more than 50 percent of the national income produced in agriculture. This rapid growth in subsidies, caused by rising state procurement prices for agricultural products and stable consumer prices for foodstuffs, has increased the money incomes of agricultural producers but has not had the expected impact on labor productivity and efficiency in the agrarian sector. The extremely cumbersome subsidy system has led to numerous abuses and waste of material resources. Even the success of the program in keeping consumer prices stable may be illusory, as the growing spread between high procurement prices and low consumer prices has sponsored black market activities that have pushed the effective prices paid by consumers substantially above posted state prices.

The much heralded 20-year food program announced at the May 1982 meeting of the Central Committee projects further expansion of subsidies and no essential changes in the present system.

1. DEVELOPMENT OF THE SUBSIDY SYSTEM

Direct and indirect subsidies to agriculture are a well known phenomenon in both free-market and planned economies. What makes the Soviet system unique is the magnitude of the subsidies and their rapid growth in the last 10–15 years. Since the system was introduced in 1965, subsidies have risen from about 2 billion rubles to 37 billion in 1980. In the latter year, they amounted to nearly 54 percent of national income generated in agriculture, as defined in Soviet statistics, or almost 25 percent of the gross output of agriculture.[1] This remarkable growth, and the overall magnitude of the subsidies, have not, however, resulted in any improvement in the efficiency and productivity of the agricultural sector. On a per capita basis, the gross output of agriculture in constant prices has been growing at the low rate of slightly over one percent per year, resulting in only a modest improvement in the diet of the Soviet people. In fact, in the early 1980's Soviet agriculture appears to be more of a problem sector than it was in the late 1950's, and early 1960's, making necessary large imports of agricultural products and increasing the nation's dependence on foreign sources of food. The development of agriculture is, of course, affected by a multitude of factors of which the government's price-subsidy policy is but one. But as the analysis in this study shows, the subsidy program does not appear to have had any beneficial results.

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The purpose of this paper is to examine this system of state subsidies, to estimate the major elements of these subsidies, and to explore their impact on the economy.[2]

The relationship between the state budget and agriculture is highly complex. The state directly finances the activities of a number of sovkhozes and underwrites sovkhoz deficits; it finances irrigation and soil programs, makes grants to the social security fund of kolkhoz members, periodically declares cancellation of long term debt of kolkhozes, and the like. On the other hand, it should be recognized that possibly as much as three-quarters of the turnover tax revenues collected by the state budget involve agricultural raw materials,[3] directly or indirectly.

This study focuses on direct budgetary subsidies to agriculture effected through the mechanism of procurement prices on agricultural products and purchase prices on certain manufactured goods sold to agriculture. No attempt will be made to assess the overall balance of payments and expenditures between the state budget and agriculture.

Practically all agricultural products receive some form of subsidy: most grains, sugar beets, potatoes, fruits and vegetables, sunflower and other oil seeds, meat, poultry, milk, fish, eggs, cotton, wool, flax, and hemp.

The present system of subsidies originated at the March 1965 Plenary Session of the Central Committee. This meeting set new agricultural policies aimed at increasing the productivity of Soviet agriculture by providing greater material incentives to producers, particularly by increasing the real income of agricultural labor.

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[1] Subsidies from tables 1 and 2 below; national income and gross output of agriculture from Narodnoye khoziaistvo SSSR v 1980 g., pp. 49 and 879. All values are in current rubles.

[2] This paper is part of the ongoing work on Soviet agicultural subsidies being conducted at the Foreign Demographic Analysis Division in conjunction with the work on Soviet input-output analysis. It represents an updated and expanded version of an earlier more technical study by the same author (V. G. Treml, Agricultural Subsidies in the Soviet Union, Foreign Economic Report No. 15, Foreign Demographic Analysis Division, Bureau of the Census, Washington, D.C., 1978). The methodology of estimation, the detailed description of subsidies by type of product, and the documentation are not repeated here.

[3] The turnover tax, which in recent years has provided about 30 percent of all state budget revenues, is treated in Soviet national income statistics as originating almost exclusively in industry.

This was to be achieved by raising procurement prices on agricultural products, and, after the 1967 price reform, by keeping down the prices paid by kolkhozes and sovkhozes for industrial products such as mineral fertilizer and machinery. Implementation of the March 1965 program was complicated by the much broader objectives of the general economic reform of September 1965, which set profit as one of the main criteria for the success of an enterprise and established from profits a pool of incentive payments to labor and management. In line with these objectives, agricultural procurement prices were supposed to be set at sufficiently high levels and differentiated by regions and organizations so as to allow kolkhozes and sovkhozes a "normal profit." [4]

The 1965 agricultural program was, however, constrained by several other policy goals of the general economic reform. First, the government was on record as having assured the population that none of the proposed price changes would affect consumer prices. Secondly, the principle of the overriding importance of profitability was applied in the same measure to industry as to agriculture, but industrial enterprises could not be expected to achieve normal profitability when faced with rising and differentiated prices for agricultural inputs while maintaining stable selling prices.[5]

A cumbersome system of state budgetary subsidies and accounting prices on agricultural products (for transactions with industry) was gradually developed to mitigate the conflicts inherent in these multiple policy objectives. In brief, the whole system as it evolved from the late 1960's has operated as follows. Differentiated procurement prices were established for each agricultural product to assure average profitability for each producer. The food and light industries that process agricultural raw materials pay more or less uniform accounting prices, which are set low enough to make it possible to produce final products at unchanging retail prices. The difference between the higher procurement prices and the lower accounting prices is covered out of the state budget,[6] which, in effect, means subsidizing stable consumer prices.

The declared intent to increase the money incomes of agricultural labor, and the need to deal with continuous increases in the costs of other agricultural inputs, made it necessary for the authorities to increase and adjust procurement prices periodically. Thus, the system, which appeared rather cumbersome at its inception, has become increasingly complex and ineffectual. The main problem is that, despite rising agricultural income, neither labor productivity, nor yields per acre, nor livestock productivity, increased appreciably. Accordingly the authorities felt that additional incentives were needed.

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[4] The transfer of sovkhozes from direct budgetary financing to a "khozraschet" basis (i.e., to financial independence) was started in 1967 (Resheniia partii i pravitel'stva po khoziaistvennym voprosam, Moscow, Politizdat, 1968, vol. 6, pp. 370–388).

[5] For an evaluation of the post-1965 reforms, see Gertrude Schroeder, "The 1966–1967 Soviet Industrial Price Reform: A Study in Complications," Soviet Studies, Vol. XX, No. 4, 1969, pp. 462–477; and by the same author, "The Soviet Economy on a Treadmill of 'Reforms'," in U.S. Congress, Joint Economic Committee, Soviet Economy in a Time of Change, Washington, D.C., Vol. 1, 1979, pp. 312–340.

[6] Under the procurement schemes for most products, accounting prices are lower than procurement prices and a budgetary expenditure is required. However, in the case of some products such as grains, cotton, and others, the level of procurement prices has been such that in some periods the average procurement prices were lower than accounting prices, with a resulting payment into the budget (V. N. Semenov, Rol' finansov v razvitii sel'skogo khoziaistva, Moscow, Finansy, 1973, pp. 249–253).

The 1965 agricultural program established a special bonus of 50 percent over the fixed procurement price for above-plan deliveries of wheat, rye, and cotton. In 1970 the 50-percent bonus was extended to above-plan procurement of meat, poultry, milk, wool, and eggs, and in later years this incentive scheme was made applicable to all agricultural products.[7] Procurement price differentials were also extended to provide incentives for improving the quality of the produce delivered; thus, a variety of special supplements to procurement prices were established for meat, milk, and other products.

The accounting prices, which were supposed to remain uniform to insure average profitability for the industrial processing enterprises, did not escape differentiation. Reflecting different cost and price conditions in industries buying the same raw materials but producing different products, the authorities introduced differential accounting prices. For instance, the price for potatoes paid by the alcohol producing industry is different from the price paid for potatoes by enterprises producing starch.

In a different program originating at the time of the 1967 price reform, certain manufactured goods, such as mineral fertilizer, machinery, and processed animal feeds, sold to agriculture were subsidized by the state budget, which would cover the difference between the higher prices received by the producing industries and the lower prices paid by kolkhozes and sovkhozes. In certain instances, the level of procurement prices was tied to the level of subsidies on manufactured goods sold to agriculture. Thus, the end of subsidies on processed animal feeds announced in 1975 was reported to have been made up to milk producers by an increase in procurement prices for milk in the same year.[8] The 1978 doubling of gasoline prices for most buyers, including agriculture, was compensated by a new subsidy on gasoline (see below), but the 1969 increase in prices for gasoline and other petroleum products was supposed to have been compensated by increased procurement prices.[9]

Thus the whole system is an immensely complex set of differentiated procurement and accounting prices, subsidies, and surcharges, that are continuously being juggled by the authorities in pursuit of conflicting goals and policies.

No surprisingly this system of multiple prices and subsidies invites numerous abuses, evasions, and distortions. The 50-percent bonus over the fixed procurement price paid for above-plan deliveries, in particular, has been frequently abused. One way for kolkhozes and sovkhozes to increase their bonus is to purchase livestock from private owners (who are not entitled to the bonus and can receive only the base procurement price) and to include this stock with their deliveries to the state, thus boosting their bonus payments.[10]

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[7] In the late 1970's, the bonus payments for above-plan deliveries amounted to about 3 billion rubles per year (V. N. Semenov, Finansy SSSR, No. 1, 1982, pp. 24-25).

[8] R. Gumerov, Sovershenstvovanie tsenoobrazovaniia i razvitie khozraschetnykh otnoshenii v sel'skom khoziaistve, Moscow, Kolos, 1976, p. 174.

[9] R. Gumerov, Planovoe khoziaistvo, No. 12, 1978, pp. 21-27.

The subsidy on agricultural machinery and equipment and the special tax-like surcharges on spare parts for machinery have led to the practice of writing off machines that are still functioning and taking them apart for spare parts.[11]

Generally speaking, the artificially low accounting prices paid by processing industries for agricultural raw materials and the artificially low (subsidized) prices paid by kolkhozes and sovkhozes for industrial goods have led to wasteful uses. The processing industries are not constrained by correct prices on inputs and are negligent in the proper storage, handling, and accounting of these inputs.[12] Kolkhozes and sovkhozes are apparently equally wasteful in their use of mineral fertilizer and other subsidized and "inexpensive" inputs.[13]

An interesting, but unfortunately unexplored, issue is the relationship between kolkhozes and sovkhozes on the one hand and peasants and workers operating private plots on the other. Are the benefits of the various subsidies extended by the state to kolkhozes and sovkhozes surreptitiously passed on to private plot operators? A recent article reports that private owners of livestock have been receiving cattle feed from kolkhozes and sovkhozes free or at half price. The author estimates that private plots have been receiving help from kolkhozes and sovkhozes at the rate of about 5–6 billion rubles per year.[14] This is a surprisingly high figure, and in all probability most of this flow takes place without the approval of higher authorities.

The low retail prices on foodstuffs sold through the state retail system have been conducive to waste. The Soviet media have reported numerous instances of wasteful use of food in public dining facilities, of the use of bread and bakery products as cattle feed, and the like.[15] It is interesting to note that on two separate occasions major Soviet newspapers carried articles complaining about the fact that the state system of subsidies on meat leads to wasteful use of meat as dog food. The well known Soviet journalist, Shatunovsky, who came as close to being a muckraker as possible in the USSR, has reported that the subsidy on meat used as dog food amounts to about 1.5 billion rubles per year.[16]

The key issue and the principal problem in the entire program was and remains the following. Regardless of whether the price authorities have been successful or not in matching prices to local cost conditions, the system is aimed essentially at providing normal or average revenues to sovkhozes and kolkhozes and not at increasing the allocative efficiency of agriculture by changing the output mix in different parts of the country and by reallocating resources. Thus, this attempt to simulate the price adjustments of a market mechanism (which was probably impossible to achieve anyhow), while at the same time denying to this mechanism any resource allocation functions, which the planners and administrators have reserved for themselves, was doomed to failure.

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[10] V. N. Semenov, Finansy SSSR, No. 6, 1977, p. 24. See also Radio Liberty-Radio Free Europe, Current Abstractions and Annotations, No. 8 (109), 1980, p. 13; and G. Klimenko, Finansy SSSR, No 12, 1978, pp. 21–27.

[11] V. N. Semenov, Finansy SSSR, No. 4, 1979, p. 17.

[12] V. N. Maslennikov and V. M. Afremov, Finansy SSSR, No. 8, 1975, p. 53; M. V. Kokorev, Tseny na tovary narodnogo potrebleniia, Moscow, Ekonomika, 1978, p. 14.

[13] V. N. Semenov, Finansy SSSR, No. 4, 1978, p. 17; A. Postnikov, Nash sovremennik, No. 12, 1977, p. 167; L. P. Matveeva, Finansy SSSR, No. 12, 1977, pp. 59–60.

[14] A. Kalinkin, Ekonomika sel'skogo khoziaistva, No. 4, 1982, p. 67.

[15] See, for instance, A. Zaitsev, Ekonomika Sovetskoi Ukrainy, No. 12, 1977, p. 72. In his address to the May 1982 Plenary Session of the Central Committee, Brezhnev complained about the waste of foodstuffs in the trade and distribution system (Pravda, May 25, 1982, p. 2).

[16] I. Shatunovsky, Pravda, July 1, 1981, p. 6; and N. Dergachev, Trud, May 15, 1982, p. 4.

2. ESTIMATION OF THE VALUES

Soviet literature does not provide enough information for a comprehensive analysis of policy making in the area of agricultural pricing. The information that is available suggests there is no coherent overall policy. Examination of price, subsidy, and output data for the last 15 years reveals no clear pattern of relationships between agricultural performance and the policy of setting prices and subsidies for individual commodities. It would appear that most of the changes in specific procurement prices and subsidies that the price fixing authorities have introduced in this period have been established on an ad hoc basis and that the only common factor in all of these changes is the existence of persistent financial losses to the producers.

The absence of comprehensive and clearly defined statistics on agricultural subsidies in Soviet official statistical publications and in the economic literature probably reflects not so much on censorship and secrecy as on the complexity of the issues involved and the general state of confusion surrounding the topic.[17] Government officials and economic analysts have periodically referred to either the total value of subsidies for a given year or prices and subsidies on specific commodities or in different regions. Some particular aspects of the program are almost never mentioned, such as, for instance, surcharges on spare parts for agricultural machinery and equipment or surcharges on milk and dairy products. Other elements, such as the total value of the subsidy on fertilizer, machinery, and gasoline, have been routinely included in the discussion of the projected state budget, starting in the late 1970's.

In the absence of comprehensive statistics for all years it was necessary to engage in review of all references to subsidies, in interpretation of the selected data released, and in estimation of the many gaps. A summary of subsidies and supplements by major groups and estimates of values for the period 1970–1980 follow.

Subsidies on agricultural products purchased by the food and light industries. These subsidies, which constitute the major share of total subsidies to agriculture, were introduced following the 1965 reforms in agriculture to cover the difference between the high and growing procurement prices received by agricultural producers and the relatively low and stable so-called accounting prices paid for the same products by the food and light industries that process them. These subsidies are handled through the procurement organizations, which receive from the state budget the necessary funds to cover the difference between the prices paid to agriculture and the prices received from industry. The rates of subsidization have differed over time, but virtually all agricultural raw materials purchased by industry are subsidized: most grains, sugar beets, potatoes, vegetables, sunflower and other oil seeds, meat, poultry, milk, fish, eggs, cotton, wool, flax, hemp, and hides. In the late 1970's, this subsidy accounted for close to 40 percent of the total state procurement of agricultural products.

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[17] The state of confusion surrounding the issue of the financial relations between the state budget and agriculture is manifested in the publication of state procurement data in the annual issues of Narodnoe khoziaistvo. The puzzling aspect of these data is that while the various quantities of agricultural products procured are revised only slightly after first publication, the payments for these products are invariably revised significantly, either upward or downward, in the handbook for the following year.

The system is too complex to be described here in detail, but we should note some peculiar features.

Unlike the subsidy on manufactured goods sold to sovkhozes, kolkhozes, and other state agricultural organizations (see below), the subsidy on agricultural raw materials sold to the state applies not only to all of these but also to the produce of private plots.

On some agricultural products the subsidies are general in the sense that all industrial buyers pay the same accounting price, while on other products they are industry specific. For instance, as noted above, potatoes are purchased by the procurement organizations at a certain price and sold at lower prices that are different for such users as the alcohol industry and the starch industry.

Purchases of milk by the dairy industry are subsidized, and at relatively high levels. However, the output of many dairy products and production at some dairy plants is excessively profitable, and part of this profit is preempted by tax-like surcharges. In the following discussion we will refer to a gross milk subsidy, meaning the total charged to the dairy products industry, and to a net subsidy, i.e., the gross subsidy with surcharges on milk netted out.

For the purposes of national income accounting, the subsidies on agricultural raw materials purchased by processing industries are carried in the industry accounts, i.e., national income produced in industry includes a negative entry corresponding to the subsidy.

There is, however, another form of subsidy which is paid to wholesale trade organizations for produce sold directly to them, bypassing industry. In the early 1970's the increase in procurement prices for potatoes and vegetables, and particularly the rising costs of transporting, storing, refrigerating, sorting, pickling, etc., of vegetables, led to losses in wholesale trade. In 1972, the government introduced a subsidy to cover these losses, payable to the trade organizations.

The estimates of the subsidies on these various groups of agricultural commodities are summarized in table 1.

TABLE 1.—SUBSIDIES ON AGRICULTURAL PRODUCTS [1]

[In millions of current rubles]

Year	Meat and products	Milk and dairy products	Fresh vegetables [2]	Other agricultural products	Gross subsidy	Surcharges on milk	Net subsidy
1970	9,300	3,300	0	2,850	15,450	750	14,700
1971	10,600	4,080	0	2,020	16,700	800	15,900
1972	11,200	4,360	411	2,490	18.461	850	17,611
1973	12,400	4,770	428	[3] 30	17,628	900	16,728
1974	11,500	5,020	511	1,930	18,961	950	18,011
1975	12,200	6,500	575	1,800	21,075	1,000	20,075

TABLE 1.—SUBSIDIES ON AGRICULTURAL PRODUCTS [1]—Continued

[In millions of current rubles]

Year	Meat and products	Milk and dairy products	Fresh vegetables [2]	Other agricultural products	Gross subsidy	Surcharges on milk	Net subsidy
1976	11,860	6,690	668	2,850	22,068	1,200	20,868
1977	15,240	7,240	827	1,540	24,847	1,220	23,627
1978	16,340	7,190	842	2,660	27,032	1,390	25,642
1979	16,300	8,970	1,446	2,430	29,146	1,400	27,746
1980	16,650	8,690	1,364	6,060	32,764	1,400	31,364

[1] The estimates for 1970–75, as well as the methodology and documentation, are described in V. Treml, Agricultural Subsidies in the Soviet Union, Foreign Economic Report No. 15, Foreign Demographic Analysis Division, U.S. Bureau of the Census, Washington, D.C., 1978. The derivation of the 1976–80 estimates, with full explanation and documentation, is given in V. Treml, "Notes on Subsidies in Soviet Agriculture," available upon request from the Foreign Demographic Analysis Division, Bureau of the Census, Washington, D.C. 20233.

[2] Subsidies on fresh, frozen, and pickled vegetables, and potatoes that are procured directly from agriculture by the consumer trade network. The subsidy on vegetables and potatoes used as industrial inputs and in canning is included with other agricultural products. For more details see text.

[3] The drop in 1973 is explained by elimination of a major subsidy on cotton in that year.

Subsidies on manufactured goods sold to agriculture. These subsidies were put into effect to insulate sovkhozes and kolkhozes fully or partially from rising prices on the manufactured goods sold to them, and, as a rule, represent the difference between the higher prices received by the producing industries and the lower prices paid by agricultural organizations. The difference is absorbed by Soiuzsel'khoztekhnika (the state organization that supplies agriculture with most manufactured goods), which is than compensated from the state budget. Broadly speaking, there are five groups of subsidized products.

(a) The machinery and equipment group. This includes tractors, agricultural equipment, trucks, and roadbuilding machinery. This subsidy started in 1967 when enterprise prices for most machines were raised. Presumably, the level of prices on machinery paid by agriculture remains at the pre-1967 level, and when a new machine is produced the State Committee on Prices fixes two prices—a higher enterprise price to be collected by the machinery producing sector and a lower price to be paid by agriculture. Numerous complaints found in the Soviet literature indicate that prices paid by agriculture for new machinery have not remained constant (i.e., at the pre-1967 level) but have been rising faster than the technical characteristics and capacities of the machines would warrant.[18]

In the late 1970's about 13 percent of the value of machinery and equipment sold to kolkhozes and sovkhozes (as measured in wholesale industry prices) was covered out of the state budget,[19] thus constituting a subsidy allowing agriculture to purchase machinery at lower prices.

While the sale of machinery and equipment to agricultural organizations is subsidized, spare parts and some components sold directly to kolkhozes and sovkhozes or used in the repair of their machinery at Soiuzsel'khoztekhnika facilities are subject to tax-like surcharges payable into the budget.

It should be noted that the rates for Soiuzsel'khoztekhnika services for repair and maintenance of machinery belonging to agricultural organizations presumably have not changed since 1967, while the actual cost of repair work has increased,[20] thus constituting another form of subsidization of agriculture. There is, however, no information on this subject and no data that would make it possible to estimate the ruble values involved.

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[18] See for instance, V. N. Semenov, Finansy SSSR, No. 10, 1978, p. 12.

[19] V. N. Semenov, Finansy SSSR, No. 6, 1977, p. 21.

(b) Mineral fertilizers. This subsidy also originated during the 1967 price reform, when enterprise prices for minieral fertilizer were raised some 33 percent but kolkhozes and sovkhozes continued to pay the pre-1967 prices. In the late 1970's the state subsidy covered about 37 percent of the mineral fertilizer purchased by agriculture, valued at wholesale industry prices.[21]

(c) Processed animal feeds. The subsidy on processed animal feeds is similar in nature to that on fertilizer and machinery. In the early 1970's the state budget covered about 24 percent of the industry wholesale price on feeds sold to agriculture.[22] This subsidy was discountinued in 1975, at which time the authorities claimed that increases in state procurement prices for meat and milk would compensate agricultural users for the increase in the price of animal feed.

(d) Electrical power. Part of the subsidy package offered to agriculture at the time of the 1967 price reform was a special low rate on electrical power used for productive purposes in agricultural.

(e) Gasoline. Subsidization of gasoline purchased by agricultural organizations began in 1978, when the retail price of gasoline was approximately doubled. Subject to certain limitations, kolkhozes and sovkhozes were allowed a 50 percent rebate on gasoline purchased which, in effect, amounted to buying gasoline at the lower pre-1978 price.

The estimates for this second type of subsidy are presented in table 2, and the totals for both types are summarized as follows (in millions of rubles): 1970—16,858; 1971—18.404; 1972—20,487; 1973—20,209; 1974—21,996; 1975—23,154; 1976—24,286; 1977—27,227; 1928—30,673; 1979—33,122; 1980—37,208; gross of surcharges.

TABLE 2.—SUBSIDIES ON MANUFACTURED GOODS SOLD TO AGRICULTURE [1]

[In millions of current rubles]

Year	Machinery and equipment	Mineral fertilizer	Electrical power	Processed animal feed [2]	Gasoline [3]	Gross subsidy	Surcharges on spare parts	Net subsidy
1970	432	365	136	475	0	1,408	576	832
1971	516	466	161	561	0	1,704	603	1,101
1972	568	560	189	709	0	2,026	579	1,447
1973	715	700	215	951	0	2,581	575	2,006
1974	854	800	250	1,131	0	3,035	620	2,415
1975	842	951	286	0	0	2,079	695	1,384
1976	850	1,043	325	0	0	2,218	726	1,492
1977	883	1,150	347	0	0	2,380	784	1,596
1978	970	1,230	376	0	1,065	3,641	809	2,832
1979	1,000	1,160	406	0	1,410	3,976	818	3,158
1980	1,140	1,300	444	0	1,560	4,444	841	3,603

[1] See Note 1, table 1. It should be noted that the data underlying the estimates of surcharges on spare parts for machinery and equipment are particularly uncertain, and the figures shown are probably subject to a large margin of error.

[2] Discontinued in 1975.

[3] Introduced in March of 1978.

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[20] D. Z. Koroviakovskii, Ekonomicheskie sviazi mezhdu gorodom i derevnei i zakonomernosti ikh razvitiia pri sotsializme, Kiev, Vyssha Shkola, 1977, pp. 183-184.

[21] V. N. Semenov, Finansy SSSR, No. 6, 1977, p. 21.

[22] V. N. Semenov, Rol' finansov i kredita v rasvitii sel'skogo khoziaistva, Moscow, Finansy, 1973, p. 261.

3. EVALUATION

How successful has been the system of agricultural subsidies now in effect in the USS for some 17 years? The balance sheet is difficult to draw, but we can make at least a partial assessment.

The subsidies have clearly succeeded in making it possible for kolkhozes, sovkhozes, and other state agricultural organizations to increase significantly the money income of the agricultural labor force. The average monthly wage of an employee of a sovkhoz or other state agricultural organization almost doubled in the 1965-1980 period, and the average monthly remuneration of a kolkhoz member increased by 126 percent.[23] Because of higher procurement prices the average money and in-kind income produced on private plots must also have more than doubled.

Labor productivity in kolkhozes and sovkozes in the 1965-1980 period increased, according to offical Soviet statistics, on the average by some 4.5 percent per year.[24] As a matter of fact, using the same official statistics we can calculate that in the 1950-1965 period, when most of the abuses of Stalinist agricultural policies were removed, labor productivity increased annually by 9.3 percent, that is, at twice the rate of increase during the "great leap forward" announced by Brezhnev at the March 1965 meeting of the Central Committee, which launched the new system. The Soviet authorities clearly expected better results, as suggested by the average planned rate of labor productivity increase of between 10 and 11 percent for 1965-1980.[25]

Analysis of labor productivity in Soviet agriculture and its relationship to income would take us beyond the scope of this paper, but, we can note that in all probability the reason it did not increase more commensurately with money income is that the availability of consumer goods and services in rural areas did not increase at the same rate as money income.

A question that is virtually impossible to answer in a general evaluation of the subsidy program is its effect on the financial position of agriculture and on incentives. Despite very significant increases in procurement prices (made possible, of course, by subsidies), in 1980 on the average the procurement prices did not cover the average cost of production of meat, milk, and wool, and barely covered the cost of production of sugar beets.[26] A more disaggregated picture by regions and by individual kolkhozes and sovkhozes would show even more instances of losses.

The declared policy of containing the material costs of agriculture by subsidizing major inputs into agriculture such as machinery and fertilizer did not succeed, despite the rapid growth of these subsidies (table 2). It is quite clear that the cost of these inputs has been rising throughout the entire period. According to one Soviet study, prices paid by agriculture for industrial goods rose by 35 percent from 1965 to 1975.[27] Other evidence suggests that the cost inflation has continued since 1975 and may even have accelerated.[28]

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[23] Narodnoe khoziaistvo SSSR v 1980 g., pp. 254 and 364.

[24] Ibid., p. 40.

[25] Resheniia partii i pravitel'stva po khoziaistvennym voprosam, Moscow, Politizdat, Vol. 6, p. 72; Vol. 8, pp. 364-385; and Vol. 11, p. 265.

[26] Narodnoe hoziaistvo SSSR v 1980 g., pp 209-211, 259 and 276.

The subsidy program has succeeded in restraining prices of basic foodstuffs in the USSR. With some exceptions, state retail prices on bread, sugar, vegetable oil, butter, milk, dairy products, and meat either have remained stable or have risen only moderately. We should, however, note that the beneficial effects derived from this price stability are, at least partially, illusory. In the 1965–1980 period, average food prices on the collective farm market rose by 46 percent,[29] suggesting that the price stability in state retail trade is forced, and that in fact widespread shortages are plaguing the food markets in the Soviet Union. The excess demand is manifested in longer lines at food stores and, in all probability, in increasingly active "second economy" operations which, as is explained below, result in the effective prices paid by Soviet shoppers in state retail stores being much higher than the stable posted prices.

One of the many negative aspects of the system of subsidies as developed since 1965 is that it supports the marginal producer. With the light and food industries and, ultimately, the consumer, protected from rising prices by the system of subsidies, procurement prices are set to provide at least a minimal level of profit or return to kolkhozes and sovkhozes on specific crops. While retail prices for most foodstuffs and accounting prices paid by industry for agricultural inputs are relatively uniform for the country, procurement prices are highly differentiated by republic, region, and oblast'. The high cost producer of a given crop thus continues production, and neither the producers nor the planners and administrators have any incentive to reduce-production in high cost areas and increase it in low cost areas, as consideration of economic efficiency would dictate. To illustrate with extreme examples, the cost of producing wool at sovkhozes in 1980 ranged from 19,859 rubles per ton in Lithuania to 3,390 in Turkmenistan, and the cost of growing potatoes at kolkhozes ranged from 212 rubles per ton in Moldavia to 91 in Estonia.[30]

Needless to say, with an efficient market price mechanism some regional cost differentiation is normal, as the output mix is determined not only by cost per unit but by transportation costs, regional demands, etc. Nevertheless the regional cost differentiation in the USSR seems to be unreasonably high and has been perpetuated by the system of regionally differentiated procurement prices and subsidies. For 11 major products produced by agriculture, the weighted average ratio of highest to lowest cost per product by republic was about 2.6 in 1965 and decreased only marginally to 2.5 in 1980.[31]

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[27] Z. G. Tresorukova et al., Dvizhenie tsen na sel'skokhoziaistvennye mashiny i drugie sredstva proizvodstva, postavliaemye sel'skomu khoziaistvu. Series Teoriia i praktika tsenoobrazovaniia: Obzornaia informatsiia, Moscow, NII tsen, Issue 4, 1979, p. 15.

[28] See, for example, L. Zaverniaeva and G. Mastepanova,Voprosy ekonomiki, No. 7, 1981, p. 55.

[29] B. Severin (The ACES Bulletin, Vol. XXI, No. 1, Spring 1979, p. 27) derives a price index of 1.303 for the collective farm market for 1965–1977. Using her methodology and official Soviet data on price changes, the index was updated by this author to 1.460 for 1980. It is interesting to note that while the price index for the collective farm market rose by 46 percent in the 1965–1980 period the average index of state procurement prices, based on published Soviet data and 1965 value weights, rose by 48 percent, supporting our hypothesis that state procurement prices have a major impact on farm market prices.

[30] Narodnoe khoziaistvo SSSR v 1980 g., pp. 259 and 276.

The existing system of agricultural subsidies offers numerous opportunities for illegal private gain in the flourishing "second economy" of the USSR.[32] Probably the most widespread abuse of the system takes place in state retail trade. Prices on the collective farm market are determined by supply and demand, but a major variable influencing the supply is the level of state procurement prices. In fact, collective farm market prices are often very close if not identical to procurement prices. The state-fixed retail prices for foodstuffs, on the other hand, are much lower because of subsidies, and the spread between the two sets of prices invites illegal arbitrage.

Let us consider an actual example. In 1978, the average procurement price for meat and poultry was about 3,088 rubles per ton, the average collective farm market price was about 2,990 rubles per ton, and the average state retail price was 1,730. Dishonest butchers and other personnel serving the meat counters can benefit from the price spread in several ways. To known and trusted customers the butcher simply sells choice meat cuts "through the back door" or "under the counter" at approximately the collective farm market price, pocketing the difference of some 1.30 rubles per kilogram. In the case of the general public, the butcher engages in the well known practice of "upgrading" (peresortitsa), that is, he sells lower grade meat at prices for higher grades, or simply shortweights the customer. The customer would thus pay an amount close to the effective collective farm market price, and the butcher would again pocket the difference.[33]

Needless to say cheating consumers in commerce is not a novel phenomenon nor is it particularly endemic to the Soviet system. What makes the Soviet case unique and widespread is that the customer is not likely to complain, knowing that meat is scarce and that he is in effect paying kolkhoz market prices. Were the butcher to hide the meat and close his counter, the customer would have no choice but to go to the kolkhoz market and pay a higher price. Thus, the practice is not only widespread and known but is pursued quite openly.

In the case of milk and dairy products, instead of being "upgraded" the milk is watered down or the customer is shortchanged by being sold a smaller quantity than he pays for.[34] The fact that only a small share of Soviet foodstuffs is sold in factory-sealed and price-quantity marked packages makes the practice even easier.

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[31] Based on data in Narodnoe khoziaistvo v SSSR 1980 g., pp. 259 and 276, and Narodnoe khoziaistvo SSSR v 1965 g., pp. 411 and 428. The ratios of highest to lowest cost for each product were computed separately for sovkhozes and kolkhozes. Simple kolkhoz-sovkhoz average ratios were then calculated and weighted by procurement values in 1965 and 1980 (Narodnoe khoziaistvo SSSR v 1980 g., p. 211). A more sophisticated measurement of republic cost differentiation could have been designed, but the main point of this exercise is simply to test the change between 1965 and 1980. The products included in the test were grain, cotton, sugar beets, potatoes, vegetables, cattle, hogs, sheep, milk, eggs, and wool. These 11 accounted for 85 percent of total state procurement of agricultural products in 1980.

[32] For a general introduction to the topic of the "second economy" see Gregory Grossman, "The 'Second Economy' of the USSR," Problems of Communism, Vol. 26, No. 5, 1977, pp. 25–40, and the same author in U.S. Congress, Joint Economic Committee, "Notes on the Illegal Private Economy and corruption," Soviet Economy in a Time of Change, Washington, D.C. Vol. 1, 1979.

[33] The price spread invites other forms of arbitrage. Thus, employees of state retail stores who have immediate access to new deliveries can simply buy the products at their stores and sell them, directly or through middlemen, on the farm market.

Thus, under the existing system of agricultural subsidies the entrepreneurs of the "second economy" can generate a flow of payments that may theoretically come close to the total value of the subsidies on final food products such as meat, milk, fish, vegetables, and the like. These "second economy" activities produce illegal incomes and work against the basic goal of the system under which the subsidies originated, that is, to increase incomes in the agricultural sector without increasing consumer prices.

Numerous articles in the Soviet media and reports of recent emigres from the USSR testify that the practices described here are widespread and almost universal. Exact estimates are all but impossible, but the level of illegal profits and, at the same time, additional expenditures for consumers must be in the billions of rubles.[35]

4. THE NEW 20-YEAR FOOD PROGRAM—MORE OF THE SAME

The present day Soviet leadership clearly intends to continue the set of policies introduced in 1965, including the system of subsidies on agricultural inputs into industry and subsidies on the sale of manufactured goods to agriculture. The 1965 agricultural reforms are closely associated with Brezhnev, and at least he seems to feel that the program has been successful and is to be continued.[36]

In early 1982 the Soviet economy underwent a major price reform, as a result of which average wholesale prices increased significantly.[37] According to the authorities, however, this reform was designed in such a way that consumer prices and the cost of material inputs into agriculture would be unaffected.[38] Specifically, prices on machinery and equipment, mineral fertilizer, electrical power, gasoline, and other oil products sold to agriculture will remain at the pre-1982 levels, necessitating higher subsidies. For the machinery-fertilizer group, the subsidy will increase by a hefty 58 percent, from 2.6 billion rubles in 1981 to 4.1 billion in 1982.[39]

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[34] The Soviet satirical magazine Krokodil (No. 6, 1972, p. 7) carried an interesting cartoon depicting a milk salesman telling a line of customers "Comrades, I must warn you –I did not water down the milk and therefore I will shortweight you." The remarkable aspect of this cartoon, which illustrates the point made above, is that the salesman makes his announcement quite openly, and the waiting customers are neither surprised nor angry.

[35] A research project on the "Second Economy in the USSR" funded by the Ford Foundation is being conducted jointly at the University of California, Berkeley, by Professor Gregory Grossman and at Duke University by this author. By means of a questionnaire, the project has conducted interviews with some 700 recent emigre families and has also collected numerous taped interviews and testimonies by former Soviet retail trade personnel and legal specialists. The processing and analysis of the data will not be completed for another year, but partial preliminary results suggest that personnel in the state retail system of the USSR engage in practices like those described above on a large scale. Butchers are singled out especially as earning very high profits. Several interviewers reported first hand knowledge of butchers in urban stores making as much as 500 rules per week "on the left" (the average state salary in Soviet retail trade is about 138 rubles per month).

[36] At the May 1982 plenary session of the Central Committee, Brezhnev began and ended his speech on the new food program by referring to the March 1965 program, which he declared a success, and which is clearly associated with his name (*Pravda*, May 25, 1982, pp. 1-2.

[37] See V. Garbuzov, Planovoe khoziaistvo, No. [illegible] 1982, p. 10.

[38] *Ibid.* See also Iu. Vladychin, Kommunist Estonii, No. 9, 1980, p. 38.

[39] V. Semenov, Finansy SSSR, No. 1, 1982, p. 23.

Examination of the much heralded 20-year food program recently announced does not reveal any drastic changes in the policies introduced in 1965. The new program promises more machinery, more energy and power, more fertilizer, and more capital investment for agriculture, and demands higher yields per acre, higher outputs, and higher efficiency in the production, processing, and distribution of agricultural products. Interestingly enough, the emphasis on higher labor productivity so prominent in Soviet plans is absent from this program.

In specific reference to prices and subsidies, Brezhnev in his opening speech to the Central Committee meeting reported that procurement prices for meat, milk, grain, sugar beets, potatoes, vegetables, and some other products will be raised as of January 1, 1983 and that the additional cost to the budget, i.e., subsidies, will increase by 16 billion rubles in that year.[40]

The disadvantages of supporting high-cost and inefficient producers by means of higher procurement prices which was discussed above are clearly not recognized by the Soviet leader, who promised special supplements to the higher new procurement prices in cases of "deficit or low-profit producers."[41]

Generally speaking, the text of the program itself was somewhat more sumber and less self-congratulatory than Brezhnev's speech. Thus, the program in effect says that uninterrupted and universal (povsemestnoe) satisfaction of demand since 1965 has been achieved only in bread, bread products, and sugar. For 1981–1985, it promises complete satisfaction of demand for potatoes, confectionery products, margarine, eggs, and fish. As far as meat, milk, vegetable oil, fruits, and vegetables are concerned, the program promises improvements and increases, but reference to "complete satisfaction" is absent even in the discussion of the 1986–1990 plan.[42]

Most aspects of Soviet agricultural policies to date, particularly the differentiated procurement-price and subsidy system, appear to have been counterproductive and ineffective. It should be noted that most of the socialist countries with Soviet-like economic systems developed programs of high procurement prices and low subsidized retail prices in the 1960's and through the mid-1970's. However, each in its own way and with varying degrees of success and accompanying cost, these countries have begun a painful program of eliminating the subsidies and concommitantly increasing consumer prices. Only the Soviet Union as of the early summer of 1982 was not prepared even to consider changes in the system and, if the Brezhnev statements cited above are to be taken seriously, is planning to expand the subsidies.

Is elimination of subsidies under Brezhnev's successor feasible? Based on 1980 data, elimination of the subsidies by means of passing the increased costs of production on to consumers would make it necessary to increase average retail prices of foodstuffs by about

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[40] Pravda, May 25, 1982, p. 2. The projected increase is remarkably high. Without going into the details of projection and estimation, we can say that depending on different assumptions and interpretations of what Brezhnev meant, a 16 billion ruble increase implies a rise of between 40 and 45 percent in subsidies.

[41] Ibid.

[42] Pravda, May 27, 1982, p. 2.

40 percent or more.[43] The state budget funds freed by the elimination of subsidies could, of course, be spent on a full or partial compensatory upward adjustment of wages. This, however, would entail a prohibitively complex reform and realignment of all prices, taxes, and costs for the entire economy. Whether such a reform is politically feasible is impossible to say. A prominent specialist on the Soviet political situation, Professor Jerry Hough of Duke University, expects the post-Brezhnev regime to move toward more decentralization and market oriented reform, including elimination of agricultural subsides, increases in retail prices, and commensurate upward adjustment of wages.[44] Certainly, consideration, of economic efficiency, particularly in agriculture, would seem to dictate such a course of action. However, Soviet leaders have in the past been more inclined to give preference to political rather than economic desiderata.

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[43] The net subsidies on agricultural products and manufactured goods sold to agriculture amounted to about 35 billion rubles in 1980 (tables 1 and 2 above). We will disregard subsidies on agricultural raw materials for light industry, such as cotton and wool, because they are relatively small and because most final products of light industry are subject to turnover taxes that can be reduced to compensate for increased costs of agricultural inputs. The value of retail sales of foodstuffs affected by subsidies in 1980 was about 84 billion rubles (total retail sales, less public dining markup, less the so-called "other foods" which consist mainly of alcoholic beverages, less cooperative trade contract sales). Thus, the elimination of subsidies in 1980 based on this rather simplistic analysis would entail an increase of 84 to 119 billion rubles, or 41 percent, in the food bill.

[44] Los Angeles Times, May 30, 1982, section IV, p. 5. Hough also argues that the compensatory wage adjustment would place additional constraints on the budget, which "would make it necessary to limit military spending." This conclusion does not follow. The Soviet leadership may have good economic reasons to cut defense expenditures, but elimination of subsidies is not among them. Exact calculations are impossible, but we can expect that complete elimination of subsidies combined with higher retail prices and compensatory wage increases would entail no additional cost to the state budget.

VII. HUMAN FACTORS: QUALITY OF LIFE

OVERVIEW

By Nick Eberstadt*

In economic performance the human factor is always prominent. It cannot be otherwise. Economies are operated by (and to an irreducible extent, for) human beings; consequently mass behavior in its diverse dimensions sets both daily contraints and less immediate limits upon economic activity.

Human aspects of the economic process are decisively shaped by the fact that labor is an animate commodity. Physiological needs determine the minimum requirements which the production system must satisfy if household routines (much less national objectives) are to be pursued. "Human resources", unlike natural resources, may be augmented in the very process of being used. No less importantly, the delicate and inescapably human quality of motivation affects not only the supply and quality of manpower, but also the efficiency with which all other "inputs" are brought into use.

More than most other national directorates, current leadership in the Soviet Union might be expected to recognize the importance of human factors in economic development. There are both practical and theoretical reasons for this. Intellectually, the Communist Party of the Soviet Union lays claim to the Marxist-Leninist tradition; it is therefore incumbent upon the CPSU to protect and promote teachings of those two prolific writers. No good Marxist can be unaware of the broad implications of the labor theory of value, or would deny the moral necessity of organizing production to meet human needs. By the same token, an historical materialist cannot help but recongize the role of human numbers in shaping economic and political events.[1] From the practical standpoint, the current Soviet leadership's concern with human factors in development has been conditioned by events. World War II and the years of adjustment that followed it saw tens of millions of Soviet citizens perish, including many of the most talented, and promising, minds of the nation. The devastation brought on by unexpected war and forced-pace recovery have been a principal consideration in the shaping of Soviet policy since the death of Stalin. Today, the importance of the human factor is once again being impressed upon Soviet leaders, although for entirely different reasons. For the first time in postwar history, Soviet planners are facing a situation in which overall manpower is scarce. Confronted by budgetary constraints and demographic trends which are not amenable to immediate change, Soviet decisionmakers must now seek ways to maintain economic growth despite an abrupt deceleration in investment (down from about 7 growth per year percent in the early 1970's to a planned 3 percent for 1981-85 [2]) and an even more dramatic slowdown in the growth of the working-age population (which rose by 26 million between 1970 and 1982, but will increase by only 6 million between 1982 and 1995).

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NOTE.—Footnotes may be found at end of paper.

The Eleventh Five Year Plan marks a decisive break with the past: improvements in productivity must now be the principal—indeed, the overwhelming—impetus behind economic growth. Between 1950 and 1980, improvements in "total factor productivity", a Western measure which estimates the net efficiency in use of all factors drawn into production, including labor—appears to have accounted for less than 40 percent of the USSR's increment in economic output. It is meant to provide something like 75 percent of the Soviet economy's growth in the early 1980s.[3] These plans, moreover, have been cast a background in which total factor productivity is believed to have been *declining* for at least a decade, and perhaps at an accelerating pace.[3a] To stem this adverse trend, and to meet the objectives of the eleventh FYP, Soviet economic and political policy will have to come to terms with a variety of unavoidably human issues.

Analyzing the human dimensions of the USSR's recent economic performance and future prospects raises a complex continuum of questions. These might best be examined on three separate planes. The first is the plane of human numbers. The size, composition, and location of a population shapes both consumption requirements and manpower supplies. Population statistics are less likely to be affected by questions of interpretation than most other economic data, although Soviet demographic numbers are by no means free of inconsistencies.[4] Population numbers also afford an unusually reliable glimpse into some aspects of the future, since the pensioners and workers of the year 2000 have already been born, and will travel through the age pyramid in cohorts whose size can be projected with reasonable accuracy through anticipated survival ratios.

The second is the plane of issues relating to "human capital". Output and demand respond not only to changes in population numbers, but also to changes in the health, education, and skills of that population. Trends in human capital formation are generally more difficult to measure and assess than basic population trends, since most of the important variables in the former are inherently unobserveable. "Capital formation" through education, for example, can only be measured through a variety of imperfect proxies: years of schooling, expenditure per pupil, or output later in life somehow discounted for all other intervening phenomena.[5] Nevertheless, certain important facets of "human capital" may be traced through statistics on health, and others may be reflected in patterns of consumption.

The third, and perhaps least satisfactory, plane of analysis concerns human motivation. Output and efficiency are affected by human considerations which do not relate directly either to a population's size or to investments in its potential for production. Discipline, morale, expectation, and incentive weave together to form a sort of social web that conditions, and at times determines, individual economic behavior and aggregate productivity. Questions of motivation involve such nonnumerical quantities as emotion and Zeitgeist, and for this reason are perhaps better understood by the social historian or the novelist than by the economist or the demographer.[6] Nevertheless, any economic discussion of the human dimensions of Soviet economic performance which ignores this emphemeral area would be critically incomplete, and almost certainly misleading. Indications of the nature of the motivation situation in the USSR may be seen in labor relations policy, consumption and health statistics, and may also be gleaned from less official but more evocative sources of information.

HUMAN NUMBERS

Demographic trends and prospects for the USSR are outlined in Stephen Rapawy and Godfrey Baldwin's paper, and are brought into more specific focus in Ann Goodman and Geoffrey Schleiffer's analysis of the Soviet labor market and Murray Feshbach's assessment of changes in the population patterns of the Soviet Union's "Muslim" nationalities. Like other more industrial nations, the USSR has witnessed a gradual aging and a continual net urbanization of its population over the past thirty years, and has seen aggregated rates of fertility and natural increase drop. In many respects, however, the postwar demographic history of the Soviet Union is unique, and promises to continue to be so. Planners and policymakers in the USSR consequently face a number of demographic challenges that are unfamiliar to their counterparts in developed, market-oriented societies.

Economic imbalances relating to the Soviet pattern of urbanization are one set of population-driven concerns. Although the phrase "Soviet urbanization" often brings to mind the industrialization drive of the 1930s, the fact of the matter is that the growth of the cities is principally a postwar phenomenon. Between 1950 and 1980, according to Rapawy and Baldwin's estimates, the fraction of the Soviet population living in urban areas rose from 39 to 63 percent. In absolute terms, this was a rise of almost 97 million people, out of a total increase in the urban population of about 130 million since the start of the First Five Year Plan in 1928.

When cities grow, the task of feeding them grows as well. Indeed, demands placed on agriculture for surplus food may increase more rapidly than the the urban population, since city people the world over generally have higher incomes and greater political influence—hence greater scope for the articulation of their demands—than country people. In postwar USSR, the pace of urbanization has not been matched by improvements in agricultural productivity, despite expensive and ambitious efforts to invigorate this lagging sector.

As papers in other sections of this volume make clear, Soviet agriculture's disappointing performance in the recent past is less a matter of bad weather than bad policy. Policy problems can make themselves felt through a broad array of intermediaries, especially in a planned economy. While many difficulties in the Soviet food system are manifest through the transportation system and through pricing/allocation mechanisms, others make their impact through the agencies of demographics.

The USSR's rural population has been declining since the 1950s, and at an accelerating pace: in the 1970s alone the Soviet countryside lost about 7 million inhabitants. But the process of selective outmigration has tended to remove from the kolkhoz precisely those groups whose productivity in farmwork might be expected to be highest. By the late 1970s, older women were the typical kolkhoz workers; scarcely 20 percent of the collective farm labor force was made up of "able-bodied men" (the designation for those between 15 and 49).[7]

Developed, market-oriented societies currently face serious economic problems associated with the aging of their populations. In West Germany, where the situation is most pronounced, current projections suggest there will be only two people of working age (20–65) for every person of retirement age (over 65) by the beginning of the 21st century.[8] In the Soviet Union, this particular dilemma is less acute. According to Rapawy and Baldwin's projections, the ratio of those over 65 to those 20–65 will be about one to seven in the year 2000. Even if current Soviet retirement ages (60 for men, 55 for women) are not raised, the ratio of "able-bodied" to "retirement" populations promises to be on the order of three to one. In any event, the economic burden implied by these numbers might be expected to weigh lighter than it would in the West, since Soviet pensions are rather modest and a significant fraction of senior citizens (today, perhaps half of all men and a third of all women) supplement this income by continuing work.

Prospective Soviet manpower problems are of a different nature. In part, as Goodman and Schleiffer note, they stem from the success of past efforts to expand the workforce. Cohort for cohort, Soviet labor force participation ratios are among the highest in the world for both men and women. With a pronounced slowdown in the growth of the "able-bodied" population already underway, and likely to last until at least the mid-1990s, substantial additions to the labor force can only be obtained from still higher participation rates. Yet there appear to be few remaining sources which might be tapped without raising other economic difficulties. Further incorporation of teenagers into the workforce, for example, would seem to raise tradeoffs between the output of youths today and the future contributions that might be offered by better trained adults, while increased female participation in the labor force might prove inconsistent with fertility levels necessary for labor growth in the future.[9]

The essence of this difficulty is that the USSR has in many ways maintained a labor-intensive development strategy well past the point where economic growth could be significantly stimulated by putting idle manpower to work. Simple arithmetic would suggest that if the Soviet economy is to meet the Eleventh Five Year Plan, it will be necessary not only to maintain a high level of labor productivity among new entrants to the workforce, but also to improve the productivity of the men and women already at work. As Goodman and Schleiffer indicate, the pattern of past manpower policies is such that there is plenty of room for such improvements from even the purely technical perspective. Approximately half of the USSR's industrial labor force, for example, is still engaged principally in manual labor.

In a multi-national entity like the USSR, demographic and economic problems can go undetected if aggregates and averages are not separated into component parts. Culturally, linguistically, educationally, and economically, there are differences in the Soviet Union between the predominant Russian national group and the more than one hundred other officially recognized ethnicities. In demographic terms, the most important distinction is the one separating the USSR's European populations from its nationalities of Muslim origin. This distinction seems to complicate the process of managing manpower problems and planning for economic growth.

As Feshbach notes, the Soviet "Muslim" population is probably over 45 million people today; this is more than the entire populations of Egypt or Iran, and only slightly less than Turkey's. Like similar ethnic groups on the other side of the Soviet Union's southern border, the USSR's "Muslims" have high rates of fertility. Where Russians, Ukrainians, Estonians and other European nationalities appear to be at "sub-replacement" fertility, Tadzhiks, Uzbeks, Turkmen and other "Muslim" peoples typically seem to have five children or more. (Only 1 percent of the RSFSR's Russians live in families of seven or more; this compares with 43 percent of Uzbekistan's Uzbeks.) With the exception of the Azeris, the Tatars, and a few smaller groups, the USSR's peoples of Muslim origin appear to have broken the "law" of demographic transition. Despite demonstrable progress in health care, literacy, per capita income, and other indices of social wellbeing over the past two generations, they have maintained their pre-industrial regimen of births. As both Feshbach and Rapawy/Baldwin point out, birth rates in several Central Asian republics are estimated to have increased between 1950 and 1980.[10] Falling birth rates for the USSR's Central Asian "Muslims" are to be found only in projections about the future.

As a result of differential rates of population growth, the ratio of "Muslims" to Russians has been changing with surprising speed. In 1959, there were about five Russians for every person of Muslim heritage in the USSR. By 1979, the ratio was down to about three to one. By the turn of the century, given the likelihood of near-zero population growth for the slavic nationalities, a ratio of two to one seems possible. Even more striking is Feshbach's projection that the 0–9 cohort might contain almost as many children of Muslim as of Russian descent by the year 2000. For political reasons, one would anticipate that educational policies, linguistic measures, and other means of promoting "assimilation" among this growing group of peoples will assume greater importance over the coming decades.

One need not wait until the twenty-first century, however, to identify economic reprecussions from the "Muslim" pattern of population growth. Of the new entrants to the Soviet labor force over the rest of this decade and through the early 1990s, approximately 90 percent will come from Central Asian republics and Kazakhstan. In the USSR, ethnic groups and national republics do not overlap perfectly; indeed, as Feshbach remarks, almost a quarter of the Soviet Union's "Muslims" live in the Russian's republic. Although figures on population growth by nationality are considerably more difficult to obtain than on growth by physical location, it appears that 90 percent or possibly even more of the increment in the Soviet labor force over the next decade will be accounted for by workers of Muslim origin.

For planners intent upon boosting rates of economic output, this situation creates special challenges. Despite improvements in the quality of education in "Southern tier" republics over the past three decades, young adults of Muslim background still seem to lag in training and workskills behind European counterparts. Moreover, they have shown little inclination to move out of their native republics and into the regions of projected manpower shortage: Western Siberia and the Soviet Far East.[11] Rather, they have demonstrated a desire to remain in their own communities, even when by official measures migration would appear to be more economically rewarding.[12]

Upon inspection, the USSR's postwar urbanization appears not as an homogenous, but rather as an ethically differentiated phenomenon. While Slavs and other European people tended to move, peoples of Muslim origin tended to remain in the countryside. In Turkmenistan, there appears to have been no increase in the rate or urbanization over the 1970s; in Tadzhikistan, the fraction of people living in cities appears actually to have dropped. Elsewhere in Soviet Central Asia, marginal increments in urbanization rates appear to have much to do with in-migration from other republics. In many rural "Muslim" regions there are signs of apparent labor redundancy, including comparatively low and declining measures of days officially worked per year and hours officially worked per day. If population continues to grow rapidly in rural "Muslim" areas, and if Soviet "Muslim" migration patterns remain distinctive, Soviet policymakers will have to think seriously about new directions in regional development policy. Since such a re-orientation would quite clearly mean adopting a "second-choice" strategy, with the corresponding risk of slower economic growth, Soviet authorities will have reason to pay increasing attention to the complex subject of differentiated population policy over the coming years.

"HUMAN CAPITAL"

"Human capital" is a complex fabric of varied construction, but in all societies and for all individuals a dominant strand in it is health. Health is not only a universally desired personal attribute, valued for its own sake, but also a productive quantity in the economic equation. Improved health increases the vitality of a population, extending potential worklives and reducing the losses that come from illness or debilitation. Good health makes it easier for children and adults alike to retain the lesson of education and pick up new skills. Poor health and sickness impose a range of economic costs upon families even when health care is provided free of charge by the state. In the national economy, health problems are associated with the loss of economic potential, and reduced growth. Severe health problems—those affecting mortality as well as morbidity rates—not only constrain labor productivity, but also limit national production by altering the growth of the labor force and the shape of the age pyramid.

Soviet health trends are outlined in Rapawy and Baldwin, and the Soviet health situation is examined in more depth in Murray Feshbach's survey of current health issues and Christopher Davis' review of the economics of the health care system. Aspects of Soviet health policy are also touched upon in Gertrude Schroeder's paper on living standards in the USSR.

In the years immediately following World War II, the USSR registered remarkably rapid improvements in general health standards. According to Soviet data, life expectancy stood at 48 in 1939; by 1954, it was put at 62, and by the late 1950s it was estimated to be very close to 70.[13] In barely twenty years, it appeared that the USSR had matched sixty years of American and Western European health progress. Then, a dramatic and highly unusual reversal seems to have taken place. By the mid-1960s, the Soviet lifespan was no longer increasing. By the early 1970s, it had apparently entered into decline.

Much is still unclear about this deterioration in health conditions, including its precise dimensions. Since the mid-1970s the Central Statistical Administration has grown increasingly reticent about mortality for the Soviet Union as a whole, and in individual republics. However, in the early 1970s, when age-specific mortality rates were still being published annually, rising death rates were characteristic of infants, older women, and almost all male cohorts over 20.

One attempt to update Soviet life expectancy figures on the basis of the fragmentary and incomplete evidence currently available is presented in the Rapawy/Baldwin paper. According to these US Census Bureau estimates, life expectancy for men has fallen by about five years (from 67 to 62) since 1964, and has dropped by about three years (from 76 to 73) for women. If these are accurate, life expectancy in the USSR has undergone a secular decline during the Brezhnev era, and is now almost four years lower than it was in the early 1960s. Soviet life expectancy in fact, may be lower in the early 1980s than it had been in the late 1950s.

Little information is currently available on the ethnic differentials behind the Soviet mortality increase, but Rapawy and Baldwin's figures suggest unexpected differences in life expectancy between Republics in the mid-1970s. As might be anticipated, estimates for the least developed central Asian republic—Kirgiziya, Tadzhikistan, and Turkmenia were lowest, corresponding roughly with life expectancy for Lebanon (66).[14] But lifespans appeared to be longest in Georgia and Armenia (73 and over); only there would life expectancies appear to be comparable with contemporary levels for North America and much of Western Europe. Interestingly, life expectancy in the RSFSR is estimated to be closer to Central Asian than to Caucasian levels; in fact, at 68, they would be the same as in Uzbekistan. The magnitude of the RSFSR's health difficulties in the 1970s are suggested by the fact that Census Bureau's estimates for male life expectancy are higher for Mexico.

Mounting health difficulties can be expected to affect labor productivity; in the USSR, they have been sufficiently pronounced to alter labor force growth. Both Soviet and Western demographers have remarked on the surprisingly slow pace at which the USSR's sex ratio is being restored to its pre-war level, and in recent years, as Feshbach notes, population projections for the year 2000 have been revised steadily downwards. In large measure, both phenomena relate to unexpected and uneven increases in age-specific mortality. Although Western analysts have yet to quantify the impact of this new pattern of "disinvestment" on the performance of the Soviet economy, there can be no doubt that health problems have contributed consequentially to the economic slow down of the past fifteen years.

To check and reverse a decline in health levels for broad segments of the population, Soviet decisionmakers must understand the proximate, and underlying, causes of increased age-specific mortality. The etiology of increasing mortality undoubtedly differs by age group. Feshbach mentions a recent Soviet study in which 6 percent of the seven-year-olds examined in Leningrad to be suffering from rickets and hypertrophy. These children were born in the 1970s, not the post-war years, and were living in one of the USSR's model cities. Reports such as this one (there are, unfortunately, others) make it injudicious to rule out malnutrition as a cause of increasing health difficulties for infants and children.

For adults, the principal proximate cause of mortality increase is known: it is the rise in cardiovascular disease. As Feshbach points out death rates associated with heart and circulatory system ailments have approximately doubled since the early 1960s.

Cardiovascular disease can be caused or exacerbated by a number of lifestyle characteristics including lack of exercise, imbalanced diet, smoking, and stress. It is also related to alcoholism. In the USSR, increasing alcohol consumption—and especially use of hard liquor—may go far in accounting for rising mortality. Purchasing power has substantially increased since the 1950s, and intoxicants have proved to be strongly superior in goods. According to estimates produced by Gertrude Schroeder and Imogene Edwards, over a sixth of the average Soviet household budget goes to hard liquor (as against 1-6 percent in Western nations).[15] And V. G. Treml has ventured a guess, based on his research into the Soviet alcohol economy, that a quarter or more of the families in slavic Republics currently spend over a third of their income on spirits.[16] While no surveys are available in the West against which this speculation might be checked, Feshbach does show that official Soviet reports indicate more is spent on drink than clothing in Latvia, and that half of the USSR's hospital beds in 1978 were occupied by patients with alcohol-related illnesses.

Even for illnesses that are in some sense self-inflicted, mortality and morbidity can be reduced by effective health care intervention. As Christopher Davis makes clear, the Soviet health system has expanded substantially since the mid-1960s. Between 1965 and 1980, health sector employment rose by 40 percent, and the fraction of health workers in the labor force increased from 5.3 to 5.6 percent. Encounters between health workers and the public also increased, with annual per capita visits jumping from 6.8 in 1965 to 9.8 in 1978. Unfortunately, these changes were not sufficient to prevent deterioration of general health conditions.

Why was the health system's response not more effective? Davis' paper provides some clues. It appears, for example, that the Soviet health strategy remained largely labor-intensive. At a time when health problems and health sector employment were increasing, the share for health in the official budget was falling (from 6.5 percent in 1965 to 5.0 percent in 1978); health expenditures as a fraction of national income at best held steady. As a consequence, medical sector wages dropped from 82 to 75 percent of the national average, making medical workers one of the lowest paid groups on the Soviet occupational scale.

Davis hints that the USSR may have an intellectual problem with the health sector: since it does not create tangible goods, it is relegated to the "nonproductive sphere", in planning classifications. But the performance of the health system may also be affected by more practical concerns. One of these is a tendency to compartmentalize services by status group. As Davis emphasizes, there is actually a multiplicity of health care systems in the Soviet Union. Besides the "public" system, there is one for the Ministry of Defense, the KGB, the MVD, the Ministry of Railroads, and of course the Fourth Main Administration for ranking citizens and political figures. With health services secure for occupations and individuals judged especially important to operations of state, the general and for more massive expenditures necessary to upgrade health care quality in the rest of the system may appear to be a matter of less immediate political agency.

The tendency of government to economize on public services that augment human capital when budgets are tight is not limited to the USSR. Within the USSR, it is apparently not limited to the health care system. Gertrude Schroeder estimates that per capita expenditures on health actually fell in 1981. She also estimates growth in educational expenditures to have been significantly less rapid than the growth of overall consumption in the 1970s, although consumption growth was slowing down. Restrictions on human service allocations can be prompted by increased efficiency of expenditure or technical advances which shift returns schedules upwards. Unfortunately, there is little evidence of either in the USSR's public services today. It seems more likely that Soviet decisionmakers have opted for a financial convenience whose economic consequences will only be felt gradually.

The USSR is the first industrialized nation to experience secular peacetime decline in its life expectancy. It may, however, no longer be alone. According to official figures, life expectancy in rural Poland fell by more than a year between the mid 1970's and the early 1980's.[17] In Czechoslovakia and Hungary, life expectancy for men was slightly lower in 1979 than it had been in 1964.[18] It may only be a coincidence that these four nations are all in the Soviet bloc. Eastern Europe's current health situation has not been examined in detail by Western scholars; as yet little has been written on the components and causes of these apparent increases in mortality rates. The seeming deterioration of health in Eastern Europe may yet turn out to be merely a statistical artifact. If it is not, the implications of what would be a fundamentally new trend in health patterns would seem extremely worrisome and far-reaching.

HUMAN MOTIVATION

In Western nations, the role of human motivation in economic performance remains a sensitive and controversial subject. Personal or national attitudes can seldom be associated with economic results precisely; consequently, generalizations about willingness to work or innate cleverness have often proved to be a breeding ground for uninformed prejudices. At the same time, informed managers have often recognized that output depends upon much more than the allocation of resources.[19] Managerial research has consistently validated this insight; variations in motivation and performance occur not only within individual shops, but also between otherwise similar firms, industries, and economies. In its study of the British auto industry, for example, the Central Policy Review Staff concluded that attitudinal factors were the principal cause of the UK's poor performance; even when educational levels were equivalent and factory equipment was identical, British autoworkers produced half as much per shift as their counterparts on the continent.[20] Just as important as the recognition that motivation-related differences in performance exist, however, is the understanding that these are not immutable. Public and private sector managers in Western nations have set themselves to improving individual and collective performance through a wide variety of financial and nonpecuniary policies.

The question of motivation is no less important in Socialist than capitalist economies. For Socialist nations, however, the answers must be sensitive to Marxist-Leninist theory and the politics of central planning. By definition, the ultimate objective of all Marxist-Leninist governments must be the attainment of communism. In Communist society, material reward and personal effort are not meant to correspond directly; instead, the individual's contribution is to be stimulated by commitment to a system which is guaranteeing the satisfaction of the needs of all. In the process of constructing Socialism, moreover, planners in a Marxist system must in theory take care to see that the structural incentives for improved productivity do not strengthen "capitalist" tendencies within society, for this would only complicate and delay the task of achieving communism.[21] Thus, the complex task of shaping incentives may be further complicated by the knowledge that certain incentives are ideologically or politically impermissible.

The Soviet Union's progress in mobilizing its population to more efficient individual performance is described in part by Goodman and Schleiffer, and is the subject of Blair Ruble's paper on Soviet labor unions. Important aspects of the Soviet motivation question are also highlighted by Gertrude Schroeder's review of Soviet living standards.

Described on paper, Soviet labor unions might sound functionally similar to the labor unions of Japan: both bear simultaneous responsibility for protecting a wide range of workers' rights and improving labor productivity. In theory, this would seem to augur well for Soviet economic performance: in Japan, after all, the labor movement is widely believed to have been instrumental in facilitating increases in economic efficiency.[22] Yet viewed in practice, there are also enormous differences in the environments in which Japanese and Soviet labor unions operate. Whatever the origins of the modern Japanese labor ethic, the impetus for improved union productivity is reinforced by the workings of the domestic labor market. Contrary to popular belief, approximately two-thirds of the Japanese nonfarm work force does not belong to unions; instead, they typically work in small firms where pressure upon wages can be intense and employment security—including unemployment insurance—is minimal.[23] Japan's labor union performance is thus conditioned by the understanding that it is a protected sector in a dynamic and highly competitive economy.

In contrast with Japan, over 98 percent of the USSR's nonfarm work force belongs to state-run unions. These unions operate in an economy in which improved sectoral performance is to be achieved through parallel development with—rather than direct competition against—the international market economy, and in which costs of production are seen as only one of several factors that determine the evolution of industrial structure. Union members perform in an environment in which the labor laws of the Stalinist era have been noticeably relaxed. As Ruble notes, criminal sanctions against labor indiscipline were removed in 1956; truancy and absenteeism no longer figure in the Soviet penal code.

Positive incentives, however, do not seem to have satisfactorily filled the space left open by the repeal of penalties. The "human relations" approach to labor problems, which was of great interest to Soviet managers in the 1960's and 1970's, does not seem to have yielded the results that were desired. As Ruble points out, the consequence has been a growing perception on the part of Soviet managers that motivation and discipline are on the wane in the work force. While this perception may be partly attributed to nostalgia or unrealistic hopes from earlier periods, it does indicate that the current labor productivity situation, for whatever reasons, is becoming increasingly unsatisfactory to a large number of the officials who must implement production plans.

In fairness, there is much in the press that would seem to justify managerial discontent. According to Literaturnaya Gazeta, for example, a spot check of Moscow department stores a few years ago revealed that over half the sales personnel on duty were intoxicated.[24] The Soviet press, of course, must instruct as well as inform. But if stories like this one reflect widespread tendencies, the challenges facing managers are indeed increasing.

Faced with what appears to have been judged a failure of incentives, Soviet labor policy appears to be inching cautiously back toward directives. As Goodman and Schleiffer point out, the Soviet Government is again becoming more directly involved in the allocation of labor within the economy, and is reinstituting certain civil penalties against worker malfeasance.

As both Ruble and Goodman/Schleiffer indicate, the Soviet debate about incentives, control, and labor productivity is continuing. Aspects of this debate are strangely reminiscent of arguments that shaped British colonial policy almost half a century ago. In those days, many foreign observers feared that the supply curve for indigenous labor was "backward-bending": in other words, that natives would do less work if wage rates rose. Others argued that labor supply and productivity problems could be eased through "inducement goods". Money, they argued, was not useful to wage earners unless there were products to buy with it; thus, labor productivity would be determined not only by capital investment, but also by the quality and availability of consumer goods that might "induce" natives to work in the monetized sector.[25]

To those who emphasize the inducements of consumerism, living standards—and expectations about living standards—are an integral element in determining worker productivity. It is extraordinarily difficult for Westerners to assess living standards in Socialist economies. In the West, quality, convenience, and availability are typically reflected in the market price of merchandized goods. In the Soviet Union, a full understanding of living standards requires knowledge about shortages and queues, shadow markets and the economics of favors. When Gertrude Schroeder suggests that Soviet living standards, in material terms, are currently at about two-thirds the Italian level, it is important to realize that this does not mean that residents of provinces south of Rome might be indifferent between their baskets of goods, delivered as market economies deliver their produce, and the Soviet basket of goods delivered through the various Soviet channels of distribution. Instead, this is a statement about how much material well being the Soviet economy would provide consumers if it behaved like a market economy—a rather breathtaking "if".

Intertemporal comparisons of living standards within the USSR are less subject to ambiguity, although they are nevertheless complicated by both conceptual and statistical difficulties. There is little doubt that the Soviet consumer was considerably better off materially in the early 1980's than in the 1950's. By Schroeder's estimate, per capita "consumption" in the USSR has nearly tripled since 1950, with the availability of foodstuffs doubling and consumer durables multiplying by a factor of fourteen. Yet despite this improvement, Schroeder argues that the consumer sector is characterized by "massive disequilibria". Moreover, annual changes in consumption, though still positive by her reckoning, have decelerated sharply since the mid-1960's. She implies that the quality of food is declining, and that "creeping inflation" not registered by official indices may be widespread.

Goodman and Schleiffer go further: they refer to "widespread pessimism" among workers about prospects for raising living standards. For this to be so, workers would have to believe one or more of the following propositions: (1) that official estimates of consumption growth substantially overstate progress in the past; (2) that past progress is not a reliable guide to prospects for the future; (3) that today's food shortages and economic difficulties are not merely transient aberrations.

Over the past two years Western visitors have made much of the scarcity of preferred foods in Soviet shops and the reinstitution of food rationing in the big cities.[26] Yet such events would seem likely to prove transitory, in part because they are so very conspicuous. On the other hand, many of the economic trends of the past twenty years, though less commonly remarked upon, would seem to signal that, despite the achievements of the past generation, prospects for consumers are no longer as bright as in the heyday of "goulash Communism".[27]

As Schroeder and Edwards have written, "remarkably little progress toward a modern pattern (of consumption) has been made in recent decades" despite substantial increases in purchasing power. Engel's law seems to have been suspended; the fraction of the Soviet household's budget devoted to foodstuffs and beverages is still over 40 percent—almost exactly the same as in the early 1960's.

Concomitant to that stasis in consumption patterns has been a sudden and rapid change in saving patterns. Since 1975, according to the Defense Information Agency, household savings have been increasing by 11 percent a year;[28] as Gregory Grossman demonstrates elsewhere in this volume, financial assets of Soviet households are up by 60 percent since 1977, even though nominal disposable income appears to have risen by less than 20 percent. In large part, the rapid rise in savings rates appears to be a response to shortages of consumer goods in the official markets. It may also speak to the growing importance of an unofficial economy for goods and services, and for which households need to maintain contingent cash balances.[29] That consumers are experiencing increasing difficulties with official marketing and distribution channels is substantiated further by the increasingly common tendency, mentioned by Goodman and Schleiffer, to supply food to workers directly through their factories, and by a semantic change in the Soviet language which has been noted by both emigres and Soviet commentators: whereas consumers used to "buy" (kupit') goods and services, they now "acquire" (dostat') them.[30]

The enfeeblement of the consumer sector would seem to be a systemic setback for central economic planning: with the growth of an underground economy and diminishing public confidence in the utility of official currency or markets, it would be increasingly difficult to direct labor or encourage efficiency through planned prices and other officially determined economic signals. Yet at the same time, there is evidence that the consumer sector's difficulties relate not only to the implementation routine, but also to an official attitude toward consumer blandishments which is at best ambivalent.

Although an unusually low fraction of the U.S.S.R.'s output is directed into consumption, this by itself is no proof of a bias against consumers: Japan, a consumer society if ever there was one, seems to have much the same breakdown of resources between consumption and nonconsumption sectors. More telling has been the official response to anticipated changes in consumer purchasing power. Despite the primacy of food and drink among consumer concerns and the longstanding Russian fondness for socializing, Soviet authorities have provided only 100,000 public dining facilities for the entire U.S.S.R.—one-quarter as many as in the United States. Despite the almost universal preference for convenience food, only a quarter of the foodstuffs sold in Soviet markets in 1976 were packaged.[31] And in a society in which Soviet women must serve not only as wage earners and goods gatherers, but also as housekeepers, the household appliance industry has been allowed to stagnate: one Soviet source estimated that only 15 percent of the housework in the USSR was mechanized, against its estimate of 80 percent for the United States.[32] There may be unintended symbolism in the well known Soviet practice of producing consumer durables as side operations in plants built for and geared toward heavy industry.

It may not be premature to ask whether the Brezhnev regime has had a political problem with consumerism. Long ago Oscar Lange showed that there is no technical reason why publicly managed economies should be less successful in meeting consumer needs than market-oriented systems.[33] Nevertheless, it is possible to imagine a number of practical dilemmas which consumerism might pose to a Marxist-Leninist government. The most basic of these dilemmas concerns the role of the Communist Party. If consumer preferences were to determine the development of the economy, then the purpose, and even the legitimacy, of Party primacy could be exposed to doubt. As long as the Communist Party remains the vanguard of the struggle for socialism and embodies the collective wisdom of the masses, economic forces which constrain it from pursuing its objectives will be regarded with suspicion by many leading officials.

CONCLUDING COMMENTS AND SPECULATIONS

The Soviet Union's current population problems, its health difficulties and its apparent failure to meet consumer expectations are matters of interest both within the U.S.S.R. and outside it. These "human" problems are fundamentally new to the Soviet Union; they are associated with the most recent stage in Soviet life—although casual links are far from certain. Nevertheless, the historical significance of these difficulties is surely not lost on either leaders or citizens in the U.S.S.R.: they come during the first protracted period of international security and domestic tranquility that the Soviet state has ever enjoyed.

In the Marxist-Leninist ontology, the notion of "historical stages" assumes tremendous importance; analyses of a given society's stage of historical development are often seen to serve as guides for policy. It is possible to argue that the Soviet Union has entered a unique, and only poorly understood, "historical stage": having been in operation for 60 years, it has seen three generations of citizens raised under the aegis of Socialism—as the state has defined the term. Of the U.S.S.R.'s 270 million inhabitants, over 240 million have known only the Soviet system; within a generation there will be no popular memory of life before the CPSU. The "New Soviet Man" may already have been created. If so, certain responsibilities common to all entrenched, ambitious, and historic systems of governance may now be weighing on the centrally planned economy of the U.S.S.R.

The current generation of Soviet adults were raised during the time of Khrushchev. To many, Khrushchev seemed a leader with a genuine faith in the ability of the Soviet state to lead the Nation to the Communist stage of development. Indeed, in 1961 Khrushchev made a public pledge that the U.S.S.R. would achieve communism by 1980. By his estimation, the nation was in the midst of the "rapid building of communism." By 1980, Khrushchev's successors had instead adopted a more cautious and businesslike description of their nation: a "developed socialist society".[34] Memory often plays an active role in shaping morale, expectations, and ultimately the economic behavior of individuals; it is possible that this shift in perceptions has had tangible economic consequences.

Historical factors incumbent upon Soviet socialism might also affect the economic performance of individuals more directly. As Theodore W. Schultz has noted, economic growth occurs in the context of disequilibrium, and the productivity of individuals is directly affected by their ability to deal with disequilibrium.[35] For the environment in which Soviet workers and consumers find themselves, maximizing household welfare may depend as much upon an ability to deal with social and political disequilibria as with economic disequilibria. The macroeconomic implications of such a microeconomic tradition merit examination.

The problems of human economics presently facing Soviet leaders seem formidable. Current arrangements have not to date proved capable of resolving manpower and consumer problems, reversing the deterioration in health conditions, or stemming the decline in total factor productivity. But this should not be taken to mean that these tasks are beyond the competence of the Soviet system. Western analysts have always had difficulty predicting Soviet performance in the face of challenges. The U.S.S.R.'s record for meeting challenges—as the CPSU's leadership has identified them—is impressive. Indeed, in a fundamental sense the Soviet state appears to be a problem-oriented apparatus. It is likely that the eventual successors to the Brezhnev generation will want to respond to the "human" problems that have emerged in the years since the ouster of Khrushchev. Their efficacy in doing so will have repercussions on more than individual economic performance.

FOOTNOTES

[1] Lenin himself drew explicit connection between the global demographic balance and the triumph of Socialism. See, for example, "Better Fewer, But Better", in V.I. Lenin, Selected Works, (Moscow: foreign Languages Publishing House, 1947), vol. II.

[2] U.S. Congress, Joint Economic Committee, Allocation Of Resources In The Soviet Union And China—1981 (Washington: Government Printing Office, 1982).

[3] Calculated from Stanley H. Cohn, "The Soviet Path To Economic Growth: A Comparative Analysis", Review of Income And Wealth, March 1976, and Abram Bergson, "Soviet Economic Slowdown And The 1981-85 Plan", Problems Of Communism, May-June 1981.

[3a] See Herbert Levine's paper in this volume.

[4] See, for example, Murray Feshbach, "Between The Lines Of The 1979 Soviet Census", Problems Of Communism, January-February 1982.

[5] For a clear exposition of this problem, see Mark Blaug, An Introduction To The Economics Of Education (Harmondsworth, England: Penguin Books, 1976).

[6] Some students of the Soviet economy have extracted useful insights into the workings of the USSR's economy from Soviet literature. The master of this art was Alexander Gerschenkron. See "A Neglected Source Of Economic Information On Soviet Russia" and "Reflections On Soviet Novels" in his Economic Backwardness In Historical Perspective (Cambridge: Harvard University Press, 1966).

[7] See Ann Lane's paper in this volume.

[8] Calculated from Deutscher Bundestag Drucksache, Bericht Über Bevölkerungs entwicklung Im BRD (Bonn: Statistiches Bundesamt, 1980).

[9] These issues are explored in more detail in Cynthia Weber and Ann Goodman, "The Demographic Policy Debate In The USSR", Population And Development Review, June 1981.

[10] An increase in the birth rate, of course, does not necessarily imply increase in total fertility rates. Changes in age structure can raise the ratio of births to population even as age-specific fertility rates are declining.

[11] See Murray Feshbach, "Prospects For Outmigration From Central Asia And Kazakhstan During The Next Decade", in US Congress, Joint Economic Committee, Soviet Economy In A Time Of Change (Washington: Government Printing Office, 1979).

[12] There are serious difficulties in using official measures of production, consumption and income to judge actual standards of living in the USSR. These problems seem to be most pronounced in the Central Asian republics. See Nancy Lubin, Labor And Nationality In Soviet Central Asia (London: Macmillan, forthcoming) for a detailed and illuminating discussion of these limitations.

[13] *Vestnik Statistiki*, various issues.

[14] Estimates in this paragraph are drawn from U.S. Bureau of the Census, World Population: 1979 (Washington: Department Of Commerce, 1979).

[15] Gertrude E. Schroeder and Imogene Edwards, Consumption In The USSR: An International Comparison (Washington: US Congress, Joint Economic Committee, 1982).

[16] Vladimir G. Treml, "Alcohol In The Soviet Underground Economy", in Gregory Grossman, ed., Studies In The Second Economy Of Communist Countries (Berkeley: University Of California Press, forthcoming).

[17] Christian Science Monitor, March 11, 1982.

[18] Population Index, Winter 1981.

[19] There is rich literature on the relationship between motivation and productivity. For an introduction to this, see Mason Haire, Psychology In Management (New York: McGraw-Hill Co., 1956).

[20] Central Policy Review Staff, The Future Of The British Motor Car Industry (London: Her Majesty's Stationery Office, 1975).

[21] This argument is made eloquently in Alain Besancon, "Anatomy Of A Specter", Survey, Autumn 1980.

[22] Such arguments can be found in Ezra Vogel, Japan: Learning From Number One (Cambridge: Harvard University Press, 1979).

[23] Ernest van Helvoort, The Japanese Working Man: What Choice? What Reward? (Vancouver: University Of British Columbia Press, 1979), and The Economist, February 23, 1980.

[24] Cited in Vladimir G. Treml, *op. cit.*

[25] See for example Colin W. Newbury, "Historical Aspects Of Manpower And Migration In Africa South Of The Sahara", in Peter Duignan and L. H. Gann, eds., Colonialism In Africa, vol. 4: The Economics Of Colonialism (Cambridge: Cambridge University Press, 1974).

[26] See, for example, George Feifer, "Russian Disorders", Harper's February 1981, and Washington Post, August 23 and September 3, 1981.

[27] This change of sentiment is evident, among other places, in the unofficial literature emanating from the Soviet Union. Moods and expectations may only be measured imperfectly, but the differences between the society described in Aleksandr I. Solzhenitsyn's The First Circle (New York: Harper and Row, 1966) and in Alexander Zinoviev's The Yawning Heights (New York: Vintage Books, 1980) appear sufficiently pronounced to circumvent questions of calibrated measurement.

[28] Allocation Of Resources . . ., op. cit.

[29] This argument is made by Gregory Grossman in "The 'Shadow Economy' In The Socialist Sector Of The USSR", an unpublished paper for the NATO Economics Colloqium held in Brussels in March 1982.

[30] See Ilya Zemtsov, "The Ruling Class In The USSR" in the Israeli journal Crossroads, Winter 1979-Spring 1979; see also N. Samokhvalov, "Zolotye krokhi", Sovetskaia Russiia, April 12, 1980. (The latter is cited in Treml, op. cit.)

[31] Schroeder and Edwards, op. cit.

[32] Ibid.

[33] Oscar Lange, "On The Economic Theory Of Socialism", Review Of Economic Studies, October 1936 and February 1937.

[34] Jerome M. Gilison, The Soviet Image Of Utopia (Baltimore: Johns Hopkins University Press, 1975).

[35] Theodore W. Schultz, "The Value Of The Ability To Deal With Disequilibria", Journal Of Economic Literature, April 1975.

ISSUES IN SOVIET HEALTH PROBLEMS

By Murray Feshbach*

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SUMMARY

At the Twenty-Sixth Party Congress of the Communist Party of the Soviet Union held in February-March 1981, the Accountability Report of the General Secretary of the Party Leonid Brezhnev spoke directly to the issue of health conditions and delivery in the country. Concern over the health of Soviet citizens is noted by him as being among the most important social tasks. He noted a major decree was issued in 1977 on measures to improve health in the country and that the capacity of polyclinics had increased by 500,000 over the interval since the last Party Congress held five years earlier.[1] Brezhnev proceeded to add the negative side to the health delivery issue.[2]

> But many inadequacies remain nonetheless. The work of polyclinics, dispensaries, and out-patient clinics which handle 80 percent of all the sick must substantially improve. Unfortunately, in a number of places they lag behind the possibilities of medicine, there is a cadre shortage, especially of middle and junior (mladshiy) -level personnel, equipment is out-of-date, modern medications are insufficient [in quantity]. Hospital and health unit construction plans are poorly fulfilled. . . . letters are received about the factual infractions of service duties by individual medical personnel, about inattention to people. . . .

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[1] TsK KPSS, Materialy XXVI s"yezda KPSS, Moscow, Politizdat, 1981, p. 61.

[2] In this and all other comments to follow, it is not to be forgotten that health care, costs, conditions, and delivery are far from perfect in the United States. Among many others, see Lester A. Sobel (Ed.), Health Care. An American Crisis, New York, Facts on File, Inc., 1976, 189 pp., espec. pp. 1-5; Alfred E. and Maria G. Miller, Options for Health and Health Care. The Coming of Post-Clinical Medicine, New York, John Wiley & Sons, 1981, 178 pp., espec. pp. 1-14; and Steven Jonas, D., et al., Health Care Delivery in the United States, Second Edition, New York, Springer, 1981, 494 pp., espec. pp. 1-11.

This statement is far from unique and serves to confirm lower-level and even clearer statements about problems in the realm of health care in the USSR.

One year earlier, the Supreme Soviet of the RSFSR passed a resolution which made specific reference to the law of September 22, 1977, referred to by Brezhnev. Their report was more explicit about the poor response by the republic health, governmental and industrial authorities in meeting the requirements of the September 22, 1977 decree. Again noting that this referred to a "number of places" as did Brezhnev, the implications are that it was fairly republic-wide. Lags in providing specialized medical care particularly for women and children were added to the notation about shortfalls in providing sufficient quantities of medicine to the population, as cited by Brezhnev one year later. The training and utilization of personnel were stated to be inadequate in addition to the insufficient supply. The turnover rate among medical personnel, particularly those assigned to rural areas, is noted to be excessive. Sanitation and hygienic conditions in schools were bad enough to be noted as not being rapidly eliminated as decreed earlier (in 1977). Production of specialized food for children by various industrial ministeries of the republic was specifically noted as needing improvement. Air, water and land pollution continued "in several places" in part because anti-pollution equipment continued to be produced in insufficient quantitites. And so on.[3]

I. BACKGROUND

What was the basis for these statements, evaluations, concern? The background lies in the overall demographic trends reflecting remarkable turnarounds in officially reported successes for many years. Reductions in fertility mean that the health of each new increment to the population and labor force is more important given sharply reduced numbers to meet demands for labor and output. Purely medical issues such as training of personnel, their distribution, practice, facilities, ethics, and so forth, also need to be addressed. Attention will be given here also to various issues of morbidity, from infectious diseases to specific health conditions, and a number of other non-economic issues. The economic issues are addressed in the paper by Dr. Christopher Davis in this volume. The results of a preliminary study of Soviet health conditions are summarized in this brief paper given time and space limitations.

After the immediate postwar period, the population of the Soviet Union grew by 1.7 percent per year over most of the 1950's. At the present time, this has been halved and is currently about 0.8 percent per year, and by the end of the century, the rate should be about 0.4 percent per year.[4] This latter rate is sharply below the rate expected only 5 years ago, when projections for this period were 0.6 percent per year. But not only fertility is down; so also is life expectancy because of remarkable increases in mortality. The implication of these forecasts are that the Soviet population will likely be less than 300 million total projected for the year 2000. Only one decade ago, the Soviet Central Statistical administration projected a figure of some 340–350 million. Estimations and projections made on the basis of information then available led to a projected figure of some 308 million (March 1977), then 302 (March 1980) and now 297 (May 1982). The ethnic composition of the Soviet population due to differential fertility rates is beyond the scope of this paper but needs to be mentioned here as the one of the underlying causes for concern about health in the Soviet Union, particularly for the excess death rates among Slavic and especially Russian males.

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[3] See "O khode vypolneniya Zakona RSFSR o zdravookhranenii i merakh po dal'neyshemu uluchsheniyu okhrany zdorov'ya naseleniya," Vedomosti Verkhovnogo Soveta RSFSR, no. 14 (1120), 3 April 1980, article 349, dated 26 March 1980, pp. 267-272, especially pp. 268-269.

[4] Unpublished estimates and projections prepared by Godfrey S. Baldwin, Foreign Demographic Analysis Division, US Bureau of the Census in May 1982, and Murray Feshbach, The Soviet Union: Population Trends and Dilemmas, "Population Bulletin," vol. 37, no. 3, Washington, DC, Population Reference Bureau, Inc., August 1982, p. 38.

According to the Soviet official data, the crude death rate (the number of deaths per 1,000 population, unadjusted for changes in age structure), has increased by about 50 percent to 10.3 per 1000 population in 1980 from the low point of 6.9 in 1964. Slightly later, the infant mortality rate increased from a remarkable achievement in lowering the rate for deaths among children aged 0–1 per 1,000 live births to 22.9 in 1971 from 80.7 in 1950.[5] Unfortunately, infant mortality rates, as well as life expectancy and other major measures of Soviet health conditions and services, no longer are published by the Soviet authorities. Thus, we do not have any officially reported infant mortality rates in Soviet statistical yearbooks for any year since 1974, life expectancy for any year since 1971/72, age and sex-specific death rates for any year since 1973–74, age-specific death rates (for both sexes combined) for any year since 1976, cause-of-death data by age group since 1971/72, the number of doctors by speciality for any year since 1975 (let alone their urban-rural distribution), age data from the 1979 census, and so forth. The last figure officially reported for life expectancy of males, for example, showed a figure of 64 years, itself down 2 years for the previous reported high of 66.[6] The current estimate is only 61.9 years of life expectancy at age 0 for males, 11.5 years less than that for Soviet females, which is an unprecedented gap among developed countries.[7]

The foregoing should not be interpreted to ignore remarkable Soviet achievements in reducing the level of infectious diseases and deaths existing at the time of their accession to power. For example, Lorimer's report to the League of Nations notes that during

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[5] See Christopher Davis and Murray Feshbach, Rising Infant Mortality in the USSR in the 1970's, Series P-25, No. 74, Washington, DC, US Bureau of the Census, September 1980. The scope and coverage of the Soviet definition as well as the data are subject to criticism. See ibid., as well as my article "Health in Russia: Statistics and Reality," The Wall Street Journal, September 18, 1981, p. 30. An unpublished paper by Prof. Warren W. Eason provides adequate basis for reconsideration of the completeness of reporting infant deaths. While I may not concur with the full scope of the underreporting asserted in this paper of about 50 percent of the increase, let alone the 100 percent attributed to A. I. Smirnov, Acting Chief of the Social Planning and Population Department, by western reports of a press conference in June of 1981. I now believe that the slope of the infant mortality may not be as sharp as noted in the Davis/Feshbach report and that I should have paid more attention to this issue. In discussion with Smirnov in Moscow in July 1982 about this specific point, he did not demur from my evaluation that perhaps as much as 25 percent of the rise was due to better reporting, but not more. The remainder of the rise was real and due to a panoply of causes which we discussed in detail for over 1 hour.

[6] See Feshbach, The Soviet, 1982, p. 34.

[7] This is not to say that male life expectancy in the United States has not decreased ever, but the decrease has never been more than 0.4 in the three instances in the post-Second World War period. The Soviet drop of 4 years is 10 times that decrease.

1917 to 1923, over 3 million persons died because of typhus, typhoid, cholera and dysentery; this no longer occurs.[8] Nonetheless, after remarkable successes in these and other individual areas of medical discoveries, services and treatments, and despite the high quality of various Professor-Doctors or individual physicians, something has gone awry in the scale, structure and direction of Soviet health indicators.

Cause-of-death data show part of the problem: The leading cause of death in the Soviet Union, as in other industrialized countries, is heart-related disease. Heart diseases account for 51.3 percent of all deaths. (Heart and blood-related diseases are combined into "circulatory diseases" at the present time.) In part the high share is related to the aging of the Soviet population overall as fertility drops in the Slavic and Baltic regions, in part to alcoholism, in part to hypertension as stress and other urban-related problems increase, and so forth. The Soviet situation has deteriorated so much in the last two decades that it could be designated a coronary heart disease epidemic.[9] While the U.S. heart-disease related deaths are still quite high, the trend is downward. Thus, in 1960, the U.S. rate was 515 deaths per 100,000 population, and in 1979, 440, a decline of 15 percent in the rate. In the Soviet Union, in contrast, in 1960, the rate was 247.3 per 100,000, and in 1979, 500.0, or an increase of over 100 percent in the rate. Simultaneously, the share of ischemic heart disease, alleged in some recent analyses to be linked to alcohol consumption, has grown from 39 percent of all heart-related deaths to 54 percent.[10] One eminent Soviet health commentator, Yu. Lisitsyn, states that one-third of all coronary heart disease is related to alcohol abuse [11] with the rate rising among persons 30 years of age and over, especially those 30-49 years old. The All-Union Cardiological Center is cited as the source for information that heart-related deaths among 35-45 year old persons increased by over 60 percent "in recent years, and for those 30 years of age and younger by 5–15 percent, depending on the specific age groups." [12]

Cancer-related deaths have increased from 115.5 in 1960 to 137.3 per 100,000 in 1978. Some one-third of these deaths are stomach cancers (opukholy zheludka) more typical of less-developed countries. For men, the second most prevalent incidence of cancer-caused deaths is respiratory, third, lymphatic and blood cells. For women, the second is cancer of the uterus, and third, of the breast.[13]

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[8] Frank Lorimer, The Population of the Soviet Union. History and Prospects, Geneva, League of Nations, 1949, p. 41.

[9] As does Richard Cooper, MD, "Rising Death Rates in the Soviet Union: the impact of coronary heart disease," New England Journal of Medicine, vol. 304, no. 21, May 21, 1981, pp. 1259-1365.

[10] In 1960, ischemic heart disease accounted for 97.3 deaths per 100,000 population and in 1977, 259.7 per 100,000. See M. S. Bednyy, Mediko-demograficheskoye izucheniye narodonaseleniya, Moscow, Statistika, 1979, p. 203. This source cites increases in blood pressure, inadequate physicial condition, poor food habits, and alcohol abuse as the cause for the rise in the rate.

[11] G. Litvinova, Pravo i demograficheskiye protsessy, Moscow, Nauka, 1982, p. 114, cites Yu. P. Lisitsyn, Alkogolizm kak sotsial'no-eticheskaya problema, Moscow, 1978, for this information.

[12] See G. Alekseyev, "Profilaktika serdechno-sosudistykh zabolevaniy," Tyl i snabzheniye Sovetskikh vooruzhenykh sil. no. 4, April 1979, p. 56.

[13] Based on data in Vestnik statistiki, no. 11, November 1980, p. 77 and ibid., no. 12, December 1973, p. 84.

The third cause-of-death is "accidents, poisoning, and injuries," especially prevalent among children 2 to 3 years of age, women under 40 and men under 50 years of age. Bednyy notes that this is the specific cause of death for 12–14 percent of all male deaths regardless of age, and 80 percent among those males aged 20–24 dying in 1970. Alternative sources indicate that alcohol abuse was the underlying cause of about 50 percent of these deaths, a remarkable share of which is due to alcohol poisoning, as documented by Vladimir Treml's research.[14] In 1976, alcohol poisoning was the cause of 39,800 deaths in the Soviet Union, as compared with less than 400 in the United States. On a comparable basis, per 100,000 population, the Soviet figure is 88 times that of the U.S. rate.

The next cause of death in rank order we are told are deaths related to respiratory-type illnesses, but no data are available.

Infant mortality due to causes other than those incorporated in the causes listed are next in order. As indicated in the work prepared by Dr. Christopher Davis and myself, an unusual increase in infant mortality appears to have occurred in the Soviet Union. The increase of over 20 percent in the officially reported rates between 1971 and 1974 before such data were terminated in primary statistical sources, combined with the secondary report of a phenomenal increase in 1 year of 2.9 per 1000 live births (up to 30.8 in 1975, according to the current Minister of Health and his co-authors), demonstrates that children were at much risk in their first year of life. It is possible that the rate of infant mortality continued to increase until about 1978 and then declined. Smirnov states that it is now about 28; if so this is a welcome decline but still needs to be documented more fully. Based on very recent information for Tadzhikistan the infant mortality rate in 1977 was 90 for the republic as a whole, with a decrease thereafter to 63 in 1979. If the reported rate of 28 in 1961 is at all accurate, or even twice that level, the increase was over 60 percent of an assumed 56 per 1000, or over 200 percent if the original figure was approximately correct.[15] Bednyy, writing in 1979, notes that in the "last decade, there is an increased frequency in the number of children born with congenital anomolies (vrozhdennyye poroki)." He refers to reports that this has been caused by "gene mutation due to exogenous factors impacting on mothers." Among the causes are "influenza epidemics, German measles, alcohol abuse, abuse of medical preparations, smoking and ionospheric radiation."

Further, diabetes is more frequently afflicting younger women, and this has, he notes, a negative impact on their offspring (potomstvo), leading to more premature births and a consequent increase in infant mortality in the first month of life of such children.[16] As will be noted later, more medical facilities for mothers and children have been opened in recent years, hopefully not too late to turn this situation around. In February of 1982, the newspaper of the medical sector contained an article entitled: "State Concern for Protecting the Health of Mother and Child," [17] which is very revealing about the range of problems in:

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[14] See Vladimir G. Terml, "Alcohol Poisoning in the USSR," *The Asian Wall Street Journal*, November 26, 1981.

[15] See M.A. Avazov, "Demograficheskiye protesessy i zdorov'ye naseleniya," Zdravookhraneniye Tadzhikistana, no 5, May 1981, p. 85.

[16] Bednyy, Mediko-, 1979, p. 128.

> The task of further reducing the infant mortality rate which continues to be important. Key factors in achieving this goal include prenatal protection of the fetus, attention to the growth and development of the health of an infant during its first year, proper diet, the prevention and treatment of prenatal pathology and bronchopulmonary, infectious and allergic ailments, and the thorough study of the medical and social determinants of infant health. Greater demands must be placed upon the research institutes of several republics with regard to these matters.
>
> Pediatric, obstetric and gynecological institutes and institutes for maternal and child health protection should devote particular attention to studying the diagnosis and treatment of perinatal brain damage, infectious and inflammatory diseases and congenital and hereditary pathology. The problem of resuscitation of newborn and premature babies is in need of serious scientific study.

II. MEDICAL ISSUES

Without a doubt there has been a vast increase in the number of doctors, the number of hospital beds, the total amount of money expended for health, the reduction in infectious diseases since the time of the October Revolution, and so forth. However, the numbers hide other problems in the sufficiency of supply to meet all current demands, the types of training, the types of doctors and their location, the behavior of the medical profession regarding their duties and patients, the sufficiency of supply of medical equipment and medicines, as well as the increase in mortality rates described earlier. This array of problems undoubtedly underlies Bednyy's comment in the July 1981 issue of Sovetskaya meditsina that "In the past 10 years there is no satisfactory correlation observed between increasing material and personnel resources of public health, on one hand, and changes in the state of health and demographic indicators, on the other hand." [18]

(a) Medical personnel

Parallel to Brezhnev's expression of concern about the shortfall in supply of certain categories of medical personnel, Izvestiya late in 1980 reports a shortage of middle medical personnel everywhere (povsemestno).[19] But the shortage is not limited to the supply of middle and lower-level personnel as indicated at the Party Congress. The Ukrainian Minister of Health notes the shortage of doctors as well as middle-level staff in his republic.[20] Former Minister of Health Petrovskiy writes in a new book that the overall supply of doctors for pediatric sections filled 95.9 percent of the authorized slots by 1978 (up from 92.6 percent in 1975).[21] This assertion is difficult to reconcile with the information that in the 12 pediatric districts of the city of Labinsk (in Krasnodarskiy Kray), there are only 7 doctors at work. In the 8 rural district hospitals in the region, only 1 has a pediatrician.[22] Medical facilities and their personnel are grossly overworked if the data from this Kray are typical given the report that the current polyclinic work norm calls for 260 patient visits per day, but they see 1,300.[23] Hopefully the situation has improved in Georgia where one report had it that in 25 rural hospitals and in 127 out-patient clinics there was not a single doctor.[24] However, an editorial in Pravda in mid-1981 reports that there still exists a "substantial number of treatment sections which are not fully staffed with physicians in certain provinces of the Russian Republic and in Georgia and Uzbekistan.[25] In Kazakhstan as well as in the Russian Republic the shortage apparently was concealed by local health agencies by appointment of persons with only a secondary medical education to fill district physician requirements.[26]

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[17] Meditsinskaya gazeta, February 17, 1982, pp. 1–2, translated in Current Digest of the Soviet Press (CDSP), vol. XXXIV, no. 8, March 24, 1982, p. 22.

[18] M.S. Bednyy, "Demographic Processes and the Role of Medical Science and Health Maintenance in Improving the Demographic Situation," Sovetskaya meditsina, no. 7, July 1981, pp. 81–84, translated in Joint Publications Reading Service (JPRS), USSR Report, Life Sciences, Biomedical and Behavioral Sciences, no. 12, JPRS no. 79338, October 30, 1981, p. 18. The excellent paper by Mark G. Field, "Soviet Union Health Services: Some Problems and Their Etiology," presented at the "Workshop on Soviet Urban Problems" at the National Conference of the American Association for the Advancement of Slavic Studies, October 1980, Asilomar, California, contains additional details. This paper is part of a volume to be edited by Henry Morton and Robert Stuart.

[19] Izvestiya, December 16, 1980, p. 2.

[20] Literaturnaya gazeta, December 9, 1981, p. 13, translated in CDSP, vol. XXXIII, no. 51, January 20, 1982, p. 1.

[21] B. V. Petrovskiy, Novyy etap v razvitii narodnogo zdravookhraneniya SSSR, Moscow, Meditsina, 1981, p. 162.

The education of doctors as well as middle and lower level personnel also has been subjected to serious criticism. As Dr. William Knaus, an American physician who has written on Soviet medicine notes, the Soviet medical schools teach by a system of protocol, not by problem-oriented techniques.[27] Dr. Z. Januskievicius, member of the national Medical Academy and the Lithuanian Academy, as well as head of the Kaunus Medical Institute, found that many physicians had difficulty responding to questions dealing with illnesses which were not included in school notes or procedures. They "are not prepared to attempt the diagnosing of nonstandard conditions on [their] own." In contrast, the problem-oriented instruction method would "help avoid this unwarranted narrowness and helplessness." [28] Erroneous diagnoses even of standard conditions appears to be a problem.

For example, during 1971–1976, incorrect diagnoses were found in the RSFSR in 25.8 percent of cancer cases, 18.0 percent of circulatory (heart and blood-related) diseases, 15.7 percent of digestive organ illnesses, 10.2 percent of respiratory diseases, and so forth.[29] Medical school curricula, like the United States, have come late to the teaching of geriatrics and gerontology, but Soviet medical schools have introduced such subjects into their curricula beginning in 1978.[30] Radiologists reportedly receive little training in the capablities of the equipment they use and how to reduce levels of radiation dosage.[31] Only in February 1981 do we find reference to the First Symposium of X-Ray Technology convened.[32] Hopefully the training received by new physicians will provide sufficient training in genetics so that more doctors will be able to answers questions correctly, given a report in 1975 that of the 500 doctors asked "elementary questions on genetics, only 2 gave the correct answers." [33] Practical instruction time assigned to students are usually carried out in "a perfunctory way to get a check mark," according to an article by a member of the Chita Medical Institute published in Izvestiya. Given its publication in the national paper, the frequency of his experience may be more worrisome if large proportions of "the young people go to the hospital, hang around there in groups for an hour or two, and then leave for home . . . . they cannot even give injections properly—carefully, painlessly, with a kind word." [34]

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[22] V. Udachin, "Rayonnyye sluzhba zdorov'ya," Sovetskaya Rossiya, September 30, 1981, p. 1.

[23] Ibid., p. 2.

[24] Digest des Ostens, April 4, 1975, cited in Radio Liberty, Referativnyy byulleten', no. 4, May 1, 1975, p. 14.

[25] "Five-Year Plan of Public Health," Pravda, June 12, 1981, p. 1, translated in CDSP, vol. XXXIII, no. 24, July 15, 1981, p. 23.

[26] B. Petrovskiy, in Izvestiya, February 24, 1977, p. 5.

[27] William A. Knaus, MD, Inside Russian Medicine, An American Doctor's First-Hand Report, New York, Everest House, 1981, p. 99, and personal communication.

[28] Z. Januskievicius, "Problems and Opinions: 'Testing Ground' for the Higher School," Pravda, December 25, 1979, p. 3, translated in CDSP, vol. XXXIII, no. 52, January 23, 1980, p. 23.

[29] Ye. V. Martynov and P.P. Yevdokimov, "K voprosu analiza oshibok klinicheskoy diagnostiki," Zdravookhraneniye Rossiyskoy Federatsii, no. 5, May 1980, p.41.

[30] Literaturnaya gazeta, July 27, 1977, p.13.

[31] Meditsinskaya gazeta, September 21, 1977, p.3.

(b) Medical supplies

Over the past 10–15 years little progress appears to have been made—despite public acknowledgement, resolution and growth in production—to resolve the issue of sufficient medical supplies, its internal distribution and quality. Acknowledgement to this day of problems range from publication of complaints from individual institutions to the Minister of Medical Industry to the Deputy Director of the CPSU Central Committee's Department of Science and Scientific Institutions. Just before Brezhnev's Accountability Report at the Party Congress meeting in early 1981, cited earlier, containing reference to out-dated equipment and shortfalls in modern medications, a joint session of the Academies of Science and of Medical Sciences was convened on November 19, 1980. Among those who spoke at this session, the Minister of Medical Industry, A.K. Mel'nichenko, reported medical equipment supply problems, presumably also including medicines.[35]

In the spring of 1977, Minister of Health Petrovskiy wrote about supply problems in the national trade union newspaper. According to David Shipler's summary of the article, Petrovskiy stated that:

> Only a few dozen of the 30,000 clinics in the country have artificial kidney machines, ... much x-ray equipment is obsolete, only 75 percent of the needed x-ray film is being produced, anesthetic equipment and artificial breathing machines are being manufactured in only half the required amounts and surgical instruments are inadequate in quantity and quality.
>
> Even such a basic tool as the thermometer is in short supply, Petrovskiy complained. Although 30 million are needed annually, . . . , 23.6 million were produced in 1976, and this year [1977] 24.1 million are planned—'much less than our order.' " Shipler continues, that "Economic planners generally 'cut the medical institutions' orders for new technology in half.' " [36]

Perhaps Petrovskiy was being unusually frank as preparations were undoubtedly underway for the issuance of a major decree in September of 1977 on health plans. But Petrovskiy's list was incomplete. Literaturnaya gazeta revealed in October of 1976 that patients in such major cities as Bryansk, Gorkiy, Kaunus, Kazan,

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[32] Izvestiya, February 10, 1981, p.3.

[33] Literaturnaya gazeta, November 26, 1975, p.13

[34] Izvestiya, January 31, 1981, p.2, translated in CDSP, vol. XXXIV, no. 5, p.5.

[35] Pravda, November 20, 1980, p.3.

[36] David K. Shipler, "Soviet Medicine Mixes Inconsistency with Diversity," The New York Times, June 26, 1977, p. 36.

Kursk, Moscow and Vilnius could not obtain insulin because the Ministry of Railway Transport would not deliver small packages except by slow train, and Yakutiya was short of novocaine.[37] The Minister of Medical Industry responded to "justified complaints" about shortfalls in supply of equipment and medicines in August of 1976. The 1976–80 plan called for substantial increases in production of hormonal, antimicrobial, antitumoral, antibacterial medicines and x-ray contrast agents amounting to an increase overall of 48 percent of synthetic preparations, 59–60 percent of vitamins, and over 50 percent of ready-to-use medicines. But he added, in a complaint heard to this day, that an insufficient amount of raw materials was being supplied by other ministries.[38] In all, in 1976, the requirements of the Ministry of Health for medical equipment was met by only 70 percent.[39]

The 1977 demand also must have been unmet if the September 22, 1977, decree was reflecting current shortfalls when it announced that the Ministry of Medical Industry "does not fully provide for the requirements of the population . . . . for medicines, eyeglasses, medical equipment, ambulances and specialized motor vehicles, medical furniture, and small mechanical tools." [40] Even in October of 1980, the Ukrainian Minister of Health decried the shortage of specialized vehicles, especially for rural hospitals in general and for every feldsher-obstetrical unit in the republic.[41] When available, apparently many are not kept in well-maintained condition or are used for other purposes such as providing transportation for staff members or hauling cargo in Moldavia and in the Tatar ASSR. The shortage of spare parts for emergency ambulances obliged the stripping of a large number in the Tatar area to keep them operating or were sent out without full complements of authorized equipment.[42] Bifocal eyeglasses are delivered in Moscow, "even in the capital," with an average delay of 9½ months.[43] Other problems include hearing aids that are banned from production by the State Standards Committee as being of poor quality or others which are declared "unsuitable for mass production." [44] Shortages of cotton, bandages, disposable syringes, needles, etc., are widely reported.[45]

Output levels are planned to grow but never seem sufficient. The Twenty-Sixth Party Congress authorized a 40 percent increase (stated as 1.4 times) in the level of output of the medical industry.[46] In the 1976–80 period production was expected to grow by 48.6 percent.[47] If production of medical equipment is less than required, then the production of medications seems to be on a yet lower scale. As noted earlier even such vital medicines as insulin and novocaine are in short supply—though not always because of the producers. There is abundant evidence that this problem of shortfalls in production of vitamins and medications is almost "a permanent crisis." Mark Field has long reported the problems of supply as well as "poor tableting, inadequate packaging, or poorly prepared and printed instructions," as well as the list of drugs in short supply, such as "antipyretics, sulfdimezin, oletetrin, medinal, injections solutions, . . . insulin, glucose, hormonal preparations [as well as] cotton, gauze, rubber articles, etc." from an article published in the journal Farmatsiya (Pharmacy) of June 1967 and by Petrovskiy in Pravda on June 26, 1968 (p. 2).[48] Current reports of insufficient supply of aspirin, as well as complex medicines for semi-synthetic antibiotics for patients with heart disease, blood substitutes (krovezameniteli), flu vaccines, and so forth persist despite the reports that medications are being produced at a higher rate.[49] The latest resolution was issued by the joint session of the health and social security commissions of the two houses of the Supreme Soviet on March 2, 1982. The commissions authorized further measures to "remove insufficiencies" in the work of the Ministry of Medical Industry in order to increase the production of medicine.[50] Mention of the participation of a candidate member of the CPSU Central Committee Politburo and First Deputy Chairman of the Presidium of the USSR Supreme Soviet, Kuznetsov, at the joint session presumably indicates the seriousness of the situation and is meant to affirm high-level interest in resolving this matter.

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[37] Literaturnaya gazeta, October 27, 1976, p. 12, translated in CDSP, February 27, 1977, p. 17.

[38] Izvestiya, August 1, 1976, p. 2.

[39] Planovoye Khozyaystvo, no. 2, February 1978, p. 22.

[40] Pravda, October 15, 1977, pp. 1–2.

[41] Pravda, October 19, 1980, p. 3.

[42] Ibid., June 11, 1981, p. 3.

[43] Sovetskaya Rossiya, September 25, 1981, p. 2.

[44] Literaturnaya gazeta, September 14, 1977, p. 12, translated in CDSP, vol. XXIX, no. 43, November 23, 1977, p. 8.

[45] See especially, Knaus, Inside, 1981, pp. 23, 24, 29, 110–111, 181, and so forth.

[46] Pravda, May 26, 1982, p. 3.

[47] Kommunist, no. 10, October 1979, p. 73.

(c) Medical facilities

Evidence is accumulating that a large number of new facilities are being built in the Soviet Union for medical research and treatment in recent years. The types of facilities reflect current concerns over specific illnesses or problems, but they appear to be concentrated too much in Moscow, to be funded from extra-budgetary sources in a number of important cases, and to be insufficient to meet current requirements.

In his report to the Congress of the Medical Personnel Trade Union at the beginning of this year, L. I. Novak's Accountability Report included the expectable statistics on changes in medical facilities during the previous 5-year plan period (1976–1980). It was noted that hospital bed capacity increased by 323,000 beds, polyclinics could now accommodate 650,000 more persons per shift, about 100 large multi-purpose and specialized hospitals of between 500 to 1,000 beds each were opened, 119 maternity homes and obstetric units were opened also, and so forth.[51] To add details to this positive note, we can add the opening of an All-union Cardiological Scientific center in Moscow and 11 other similar republic units.[52]

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[48] Cited in Mark G. Field, "The Soviet Pharmaceutical System: Considerations and Comparisons with the American System, in Pharmaceutical Manufacturers Association, The Pluralistic Approach to Drug Research, 1977, pp. 34–35, and Natasha Lisman and Mark G. Field, In consultation with Raymond A. Bauer, "The Soviet Pharmaceutical System Revisited; Developments in 1966–1972, Typescript, Russian Research Center, Harvard University, March 1973, p. 35.

[49] See Pravda, May 21, 1978, p. 3; Izvestiya, June 23, 1979, p. 3; Bakinskiy rabochiy, June 16, 1979, p. 2; Pravda Ukrainy, June 8, 1980, p. 4; Pravda, September 14, 1980, p. 3; Trud, November 12, 1980, p. 3; all published since the September 1977 decree and prior to Brezhnev's speech confirming its continued poor status.

[50] Radio Moscow, Moscow Domestic Service (in Russian) 1400 gmt, March 2, 1982, cited in Foreign Broadcast Information Service (FBIS), USSR. Daily Report, March 3, 1982, p. R6.

[51] "S"yezd profsoyuza meditsinskikh rabotnikov," Trud, January 23, 1982, p. 2.

[52] Izvestiya, September 25, 1981, p. 1.

Presumably the Minister of Health's comment early in 1977 that work was proceeding slowly in Armenia, Georgia and the Ukraine, and had not even begun in Turkmenistan, was still true in 1981 at the time of the notation that 11 had been built in the republics.[53]

Petrovskiy notes that many units were being constructed using funds from the All-Union Communist Saturday (i.e., Voluntary Workday) earned by this "free labor." A similar pattern also applies to medical facilities for maternal and child-care. An All-Union Scientific Research Center for Maternal and Child Health Care was opened in Moscow in 1979, with the equipment paid for by the earnings from the Volunteer Day honoring the 100th Anniversary of Lenin's birth.[54] Earnings from the April 1981 Volunteer Day were earmarked for construction of maternity homes, obstetrical-gynecological units, female consultation centers, children's hospitals, children's polyclinics and out-patient services, sanitoria and homes for children. In all, 116.9 million rubles so earned were allocated for this purpose, as were 11.2 million rubles for preschool child-care institutions.[55]

The 46th General Meeting of the USSR Academy of Medical Sciences was devoted to problems of health delivery to mothers and children.[56] Burenkov, the present Minister of Health of the USSR, informed the participants that three (other) all-union centers for fetal and infant care had been opened, one for genetic consultation, another for the diagnosis of congenital pathology, and a third for prenatal diagnosis. Moreover, an All-Union Infant Resuscitation Center and an All-Union Center for Surgery of Congenital Heart Defects in Children were organized, the country's first premature infant resuscitation and intensive care divisions. This list is impressive. In the case of the pediatric surgery center, the need is profound given the 1981 report by V. Burakovsky, Director of the Bakulev Institute of Cardiovascular Surgery of the Academy of Medical Sciences, that "over 30,000 children were born with [congenital heart disease] in our country every year.[57] Whether the one new center can handle a large proportion of this number is doubtful, but a beginning has been made at least. Similarly, the report on the opening of the first neo-natal intensive care unit announced by Burenkov is significant, but many more are needed; for comparison, the number of such units in the United States was 485, according to the 1980 edition of Hospital Practice, issued by the American Hospital Association.

The addition to medical facilities for complex heart surgery can be put in a comparative basis. According to the information provided Dr. Knaus by Dr. E. N. Vantsian of the All-Union Research Institute of Clinical and Experimental Surgery, by 1980, a cumulative total of 800 open-heart by-pass procedures had been performed in the USSR. According to a report in the U.S. News and World Report early this year, in 1967, some 40 such operations were performed in the United States, but in 1975, 57,000. In 1982, over 135,000 are expected to be conducted.[58] Even if an excess number of surgical procedures are performed in the United States as frequently asserted, the availability of opportunity for such corrective techniques are on a vastly different scale between the two nations.

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[53] B. Petrovskiy, in Izvestiya, February 24, 1977, p. 5.

[54] Ye. Novikov, "Zabota o detyakh—zabota o budushchem!," Kommunist, no. 9, June 1979, p. 39.

[55] Izvestiya, January 8, 1982, p. 2.

[56] State Concern for Protecting the Health of Mother and Child," Meditsinskaya gazeta, February 17, 1982, pp. 1-2, abstracted in CDSP, vol, XXXIV, no. 8, March 4, 1982, p. 22.

[57] Pravda, November 29, 1981, p. 3, excerpted in CDSP vol. XXXIII, no. 48, December 23, 1981, p. 23.

Insufficient capacity problems also are provided by the example of the optical laboratory of the Research Institute of Child and Adolescent Hygiene, under the direction of Yu.A.Utekhin. This laboratory had developed a technique for use of bifocal sphero-prismatic glasses to treat myopia. According to Pravda, some 50 million Soviets "suffer from myopia." [59] Many had been advised to go to this laboratory for corrective glasses. However, two years ago, in 1980, the waiting list was cut-off when it totalled 10,000 persons! Minister Burenkov cited a new national-level genetic consultation center as the first item on the list of new medical institutions. The origin of this facility probably can be traced at least to the call in 1969 for the establishment of medical genetics consultation offices throughout the USSR in 1970-71. The report late in 1975 that the RSFSR had organized 5 consultation offices, the Ukraine 2, and (explicitly) 1 in each of the remaining 13 republics indicated that the overall program was fulfilled, but the total of 20 was a "hopelessly inadequate figure," and almost all were understaffed, had makeshift premises, lacked laboratory facilities and equipment, and so forth.[60] It is not clear why the article states explicitly that there was 1 office in each of the remaining republics. The Institute of Medical Genetics indicates that there were none in Azerbaydzhan, Georgia, Tadzhikistan and Uzbekistan at the time. However, the Health Ministry stated that Georgia and Uzbekistan did have such consultation offices, but that Armenia and Turkmenistan did not. Whichever is correct, it indicates that the distribution of such facilities is less complete than first cited in the source. The head of the RSFSR Health Ministry's Institute of Pediatrics and Children's Surgery indicated that "in recent years 50,000 children have been found to be suffering from phenylketonuria (PKU), a hereditary metabolic disorder," and "if it is detected early enough, these children can be, if not cured, at least made full-fledged members of society." [61] But the consultation offices were visited by tens of thousands of people and "Unfortunately, many of them did not go there for prognoses but for treatment of an already advanced disease." It is not clear if all of these young people had PKU, yet it appears as if they appeared for treatment at a late stage and could not be cured. The lack of training of knowledge of genetics by almost all doctors, as referred to earlier, would add to the possibility of a late diagnosis of such illness.

Other facilities opened in recent years include the first clinic for "Comprehensive Treatment of Neuroses." The establishment of this clinic, as well as a number of social service and psychological aid offices throughout the city of Moscow, underlines the growth of a stress syndrome in urban areas of the Soviet Union.[62] According to one Soviet source about the demography and ecology of Leningrad, "Many authors write that an individual residing in a large city permanently is undergoing nerve and emotional pressures."[63] This problem is growing in recent years and these facilities are meeting a real need. The growth of stress, as well as reports of hypertension increases on the average, may have contributed also to the increase in coronary heart disease, and consequent mortality increases due to this cause.

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[58] Personal communication from Dr. Knaus, and U.S. News and World Report, February 22, 1982, p. 8.

[59] B. Mironov, "With a Correspondent's Commentary: Glasses for Distance Vision," Pravda, February 18, 1982, p. 3, abstracted in CDSP, March 17, 1982, p. 19.

[60] V. Latyshev and B. Smagin, "What Diseases Did Your Grandmother Have?," Literaturnaya gazeta, November 26, 1975, p. 13, abstracted in CDSP, vol. XXVIII, no. 18, June 2, 1976, p. 4.

[61] Ibid.

Reports on poor quality of service in the open medical system are so rampant that a few citations from the Soviet press should suffice; very little is available about the closed health delivery system available for the leadership or for institutional networks available only to staff members, such as that for the Academy of Sciences. One of the prime complaints is about the poor quality of diagnostics.[64] A. F. Serenko, the leading social hygienist of the Soviet Union, wrote in the summer of 1980 a detailed description of the problems of a district general physician (terapevty). They lacked contacts with other specialists, were not supervised properly, were overworked, one-third of whom had not undergone retraining or upgrading of their skills for over 5 years, and less than half had "Skilled categories" of knowledge.[65] Low standards of hygiene in hospitals likely lead to high post-operative infection rates. According to Knaus, about one-third of all patients in Soviet hospitals acquire such infections while in a hospital; a US rate of 3 percent would be considered high. Thus, in addition to long stays required by medical protocols for patients, time in hospitals is increased by infections, and thereby more beds are needed to provide for the hospitalized population. If urban conditions are bad in medical facilities, all reports are that the condition of rural facilities are distinctly worse.[66]

Dental services also would benefit from better supply of equipment and training of their personnel. In addition to nondurability of dentures there is a shortage of dentist chairs. In one report, there were only 3 chairs for every 10 dentists and 3 dentists for every drill. In addition, the quality of dental service was adversely affected by long lines, cramped quarters, inadequate training of dental technicians, and construction of facilities which were delayed or not started at all.[67] Other clinics and medical units for individual populations and organizations are planned to be built utilizing a new source of funds, that of collective and state farms and of industrial enterprises, according to a new program. It is hard to judge at this point how many, where, what type, etc., will be constructed under this approach. While any expansion is all to the good under the present needs, it is also not clear how the new units will be organized or how duplication will be avoided.

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[62] N. Semenova, "Esli u vas beda. . .," Sovetskaya Rossiya, October 25, 1981, p. 6, and A. Alova, "Telefon doveriya slushayet!," Trud, April 8, 1982, p. 3.

[63] See N. A. Tolokontseva and G. M. Romanenkova (Eds.), Demografiya i ekologiya krupnogo goroda, Leningrad, "Nauka" Leningradskoye otdeleniye, 1980, pp. 102, 109, 110, and 113.

[64] Among others, see Izvestiya, November 26, 1981, p. 3.

[65] A. F. Serenko, "Puti sovershenstvovaniya poliklinicheskoy pomoshchi naseleniyu," Sovetskoye zdravookhraneniye, no. 8, August 1980, pp. 5–6.

[66] See A. Romanenko, "In the Countryside—Just Like in the City" Pravda, October 19, 1980, p. 3, translated in JPRS, USSR Report, Political and Sociological Affairs, no. 1084, JPRS no. 76911, December 2, 1980, pp. 52–55; Editorial, "Sluzhba zdorov'ya na sele," Turkmenskaya iskra, January 20, 1982, p. 1; L. D. Madyyeva, "Puti sovershenstvovaniya meditsinskoy pomoshchi sel'skomu naseleniyu," Sovetskoye zdravookhraneniye, no. 5, May 1981; pp. 3–6; and Editorial, "Rural Health Services," Pravda, July 8, 1977, p. 1.

[67] Pravda, October 14, 1979, p. 3, translated in CDSP, vol. XXXII, November 7, 1979, p. 21, Pravda, October 14, 1980, p. 3; and A. Grachev, "Returning to What was Printed: Without Any Particular Changes," Pravda, March 10, 1981. p. 3, translated in CDSP, vol. XXXIII, no. 10, April 8, 1981, p. 23.

It is also hard to judge precisely the meaning of Soviet statistics on the number of new medical facilities. Petrovskiy wrote about fulfillment of health plans for 1976, and then proceeded to admit that "in recent years, 60 first-aid hospitals have been created and incorporated in this medical service network. However, in some cities the hospitals exist only on paper." [68] Is this unique? Does the chartering of an institution allow the medical statisticians to include them as a new facility before actual construction? Very confusing, to say the least.

The figures on increases in the number of hospital beds cited at the beginning of this section also need to be analyzed. Novak's report that the number of hospital beds increased by 323,000 is impressive at first glance, especially when compared to the consistent decrease in the number of beds in hospitals registered by the American Hospital Association of the United States. In the United States, the number of beds decreased from a peak of 1.7 million in 1965 to less than 1.4 million in 1978.[69] The Soviet total of 3,201,000 in 1978, and 3,324,000 in 1980 (end of year) is noteworthy. However, several additional comments are needed. First, the average length of stay in hospitals is twice as long in the Soviet Union than in the United States, averaging 17 days in urban and 13.6 days in rural hospitals, in 1974-77, and 15 days in 1980 in the USSR (both combined), to 7.4 days in the United States.[70] Second, the increase in the number of beds in hospitals of 323,000 cited by Novak does not correspond to the data published in the statistical yearbook of the Central Statistical Administration. According to the yearbook for 1980, the increase between the end of 1975 and the end of 1980 was 315,000 beds.[71] The discrepancy is not very large. More interesting, however, are the comparative data for increase in number of beds over 5-year time periods. Thus, between 1970 and 1975, the increase was 346,000, which is 20 or 30,000 larger than the Novak or TsSU figure. Between 1965 and 1970, the number of beds grew by 437,000, one-third more than the growth in the 1970-75 or 1975-80 periods. The slower current increment is surprising given the need for more capacity according to Soviet sources.

(d) Medical Research

Achievements in the area of medical research include developments in orthopedics, cancer research, ophthalmology, laser surgery, and other surgical methods (for example, using wire staples to perform lung tissue repair during surgical procedures, high-frequency sonar to shatter stones in the bladder without resort to invasive surgery). Other work includes efforts on the frontier of hypnotherapy, biofeedback, artificial organs, and the retardation of bone de-calcification.[72] The annual number of invention and discovery author certificates in the field of health has grown recently. In the RSFSR, the number of applications increased by almost three times between 1976 and 1979 (from 461 to 1145), and the number of author certificates issued by almost 4 times (from 141 to 520 in 1976 and 1979, respectively).[73]

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[68] Izvestiya, February 24, 1977, p. 5.

[69] U.S. Bureau of the Census, Statistical Abstract of the United States: 1980 (101st edition), Washington, D.C. 1980, p. 117.

[70] Planovoye khozyaystvo, no. 9, September 1979, p. 98; Knaus, Inside, 1981, p. 123; and U.S. Department of Health and Human Services, Public Health Service, Health United States 1980, with Prevention Profile, DHHS Publication No. (PHS) 81-1232, Hyattsville, Md., December 1980, p. 65.

[71] TsSU SSSR, Narodnoye khozyaystvo SSSR v 1980 godu, statisticheskiy yezhegodnik, Moscow, Statistika 1981, p. 495. Cited hereafter as Nar. khoz. v. 19—.

A survey of Soviet medical journals and newspapers found that the greatest amount of research attention in the 1970's was to be devoted to cardiovascular diseases, oncology, virology, nutrition, environmental hygienic problems, and human genetics. Serenko, writing in the May 1979 issue of the Academy of Medical Sciences journal, underscored the importance of cardiovascular research, calling it a question which "has acquired special social importance.[74] Also undoubtedly reflecting his concern about negative trends in health indicators, Serenko described the program of research on women and child care implemented since the Twenty-Fifth Party Congress in 1976. Primary focus is to be given to issues related to "study of health status of different groups of women and influence on it of working and living conditions, determination of the nature and incidence of pathology of pregnancy and parturition, causes of gynecological morbidity related to medicosocial factors, . . ."[75] In addition, much more attention is to be given to issues related to economics of health, over and above the recent increase in attention to this matter. He concedes that "the scope of research dealing with public health agencies and institutions is still inadequate.[76] And as to the available statistical data for analysis, "Traditional statistics no longer satisfy present requirements of public health management. The main task now is to make use of statistical data, rather than merely gather and process them."[77]

The positive side of medical research briefly noted above is one side of the coin. The other side deals with reports from the Soviet medical literature regarding ineffective results in half of the research conducted in the RSFSR, most of which provided for no advance over existing medical methods, that there was inadequate planning, non-integration of research, parallelism, duplication. Moreover, that individual topic Problem Commissions did not follow-up research results nor did they inform the health ministry of any problems in research organization also was a cause for concern. In addition, "in a significant number of cases, integration carries a purely formal character."[78] The absence of follow-up data from the practical application of new methods in polyclinics and out-patient clinics hampered any evaluation of the breadth and effectiveness of the application of new medical discoveries or treatments.[79]

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[72] Knaus, Inside, 1981, p. 160, and Nicholas Daniloff, "Behind Boasts, the Grim Side of Soviet Medicine," US News and World Report, March 22, 1982, pp. 16–17.

[73] N.A. Demidov and A. Lutkovskiy, "Osnovnyye nauchnyye dostizheniya nauchno-issledovatel'skikh institutov i vuzov respubliki i puti povysheniya effektivnosti nauchnykh issledovaniy," Zdravookhraneniye Rossiyskoy Federatsii, no. 9, September 1980, p. 3.

[74] A.F.Serenko, "Sociohygienic Problems of Public Health Care in the Light of the Decisions of the Twenty-Fifth CPSU Congress," Vestnik Akademii meditsinskikh nauk SSSR, no. 5, May 1979, pp. 3–10, translated in JPRS, USSR Report, Biomedical and Behavioral Sciences, No. 113, JPRS 73912, July 26, 1979, p. 51.

[75] Ibid.

[76] Ibid., p. 52.

[77] Ibid.

Late in 1980, a joint session of the Academies of Sciences and of Medical Sciences of the USSR convened in Moscow. The participants also included the Minister of Health of the USSR and the Minister of Medical Industry.[80] Much of the meeting apparently was devoted to the insufficient effectiveness of medical research, foremost of which was the gap between medical and scientific research and its application in practice. In addition, it was noted that many scientific institutes are poorly equipped with modern instruments, there is room for improvement in supplying of materials, in planning and in coordination of research efforts, and that better information flows to medical workers about the latest achievements in medical research and medicine need to be implemented.[81] A joint complex problem of research among the two academies at the session was ordered to be prepared, and a long list of research topics in the fields of biological and chemical-technological sciences, in physical-technical and mathematical sciences, in earth sciences, in social sciences, and in medical-biological, clinical and hygienic sciences as related to health issues were authorized at the joint session.[82]

Whether this program will be successfully implemented remains to be seen. An article published subsequently in Pravda about patent applications in the medical field indicates that it is much too early to see any turn-around. Too many "ministries and agencies still do not orient research sufficiently toward the development of fundamentally new treatment methods and medical hardware."[83]

(e) Medical ethics and practice

Shortly after the October Revolution, the previous tradition of physicians taking the Hippocratic oath, the traditional patient-centered approach to physician responsibility, was abolished. It was abolished because it represented "bourgeois medicine and was considered incompatible with the spirit of Soviet medicine."[84] It is not medicine that is the main frame of the physician's activity, but his active participation in the building of socialism. Ideology triumphant could not last forever, and soon after the First All-Union Conference on Problems of Medical Deontology, i.e., medical ethics, was held in Moscow in January 1969, a revised Hippocratic Oath was authorized in March 1971 and restored to its traditional place.[85] The prime cause for the restoration of the Oath was the attitude of many doctors toward their patients. As Brezhnev notes, attitudinal problems continue to this day.

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[78] Demidov and Lutkovskiy, "Osnovnyye," 1980, p. 5.

[79] Ibid., p. 8.

[80] "O dal'neysham razvitii fundamental'nykh issledovaniy dlya meditsiny," *Vestnik Akademii nauk SSSR*, no. 4, April 1981, pp. 100–106.

[81] Ibid., p. 101.

[82] Ibid., pp. 101–106.

[83] D. Konyushko, "The Effectiveness of Science: Compass for Innovation," Pravda, July 3, 1981, condensed in CDSP, vol. XXXIII, no. 27, August 5, 1981, p. 19.

[84] Cited from Mark G. Field, *The Doctor and Patient in Soviet Russia*, Cambridge, Mass., Harvard University Press, 1957, p. 174.

The words about the behavior of many medical personnel does not mean all, of course, but the widespread distribution of the origin of such comments indicates that it is not localized or anecdotal. In 1977, a Pravda editorial condemned "violations of medical ethics, indifference toward patients" as well as the irregular supply of medicines and long lines in the rural medical units of Moscow Oblast.[86] In 1978, Literaturnaya gazeta discussed problems of bribery and the black marketing of scarce medicines in Leningrad, in Krasnodar and in the Ivano-Frankovsk Oblast.[87] In 1978 the Swiss correspondent Reinhard Meier reported on an Izvestiva story about a patient in Odessa who "had been constrained to hand out a ruble note to the nursing personnel for literally everything that was done for him—including giving him a thermometer."[88] In 1979, a report about the Ukrainian Supreme Soviet meeting noted that thoughtless attitudes toward patients had been subjected to censure in a number of cities and oblasts of the republic (Kiev, Zhitomir, Kharkov, Cherkass, etc.)[89] Shcherbitskiy, the First Secretary of the Republic and a Politburo member, was noted as a participant in the discussion, thereby indicating that the situation called for high-level Party concern. In 1981, a frank report by the head of the Kaunus Medical Institute (in Lithuania) wrote in Pravda about "charlatanism and pseudoscientific substitutes for medical treatment" and that "unfortunately, you often encounter indifference [and] rudeness . . . in medical institutions."[90] In 1981, Literaturnaya gazeta reported behavior of medical officials and doctors in health units of the Railway Ministry which was sufficiently bad to require a special inquiry by an Interagency Commission composed of personnel from the Railway Ministry, the USSR Ministry of Health, and the Central Committee of the Railway Workers Trade Union.

Among the long list of correctives to be introduced was the elimination of "negative phenomena such as corruption, drunkenness, and ill-use of office facilities."[91] Later in 1981, Izvestiya reported about a doctor in Magadan who without any formal examination gave false diagnoses on medical certificates which excuse individuals from work; the charge was 10 rubles per excused workday.[92] Finally, in 1981, an interview with the Ukrainian Minister of Health reported in Literaturnaya gazeta cites his statement about the need for "improving the quality of medical service to the public and eradicating extortion, bribery and other causes." A specific plan of action was to be submitted to the Central Committee of the

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[85] Knaus, Inside, 1981, pp. 99-100, and Michael Ryan, "Aspects of Ethics (1)," British Medical Journal, 8 September 1979, vol. 2, p. 586. The latter source contains the text of the new oath.

[86] Pravda, July 8, 1977, p. 1.

[87] L. Velikanova, "Opasnyy diagnoz," Literaturnaya gazeta, no. 29, July 19, 1978, p. 12.

[88] Reinhard Meier, "Soviet Health Care: Myth and Reality," Swiss Review of World Affairs, April 1978, p. 20.

[89] A. Dolenko et al., "Na strazhe zdorov'ya naroda, " Izvestiya, June 28, 1979. p. 2.

[90] Januskievicius, "Health," 1981, p. 3.

[91] I. G. Pavlovskiy, "Ofitsial'nyy otvet, 'Krugovaya poruka'," Literaturnaya gazeta, September 16, 1981, p. 12. The author is the Minister of Railways.

[92] V. Kurasov, "Face to Face with the Law: Medical Certificate for a Bribe," Izvestiya, December 1, 1981, p. 6, abstracted in CDSP, vol. XXXIII, no. 48, December 23, 1981, p. 21.

Ukrainian Communist Party.[93] In 1982, Radio Moscow's service for North America included a statement by a commentator on U.S. and Soviet health services to the effect that: "We've had cases of doctors extorting money from would-be patients or their relatives. Even though such cases are publicized, and such physicians are stripped of their doctor's certificate and gaoled, such things do happen."[94] Izvestiya early this year reports about a "certain secret statistic" used to evaluate hospital success and consequently a hopeless, gravely ill patient was not admitted. The chief physician is reported to "give preference to patients who might recover their health."[95]

And then there is Azerbaydzhan. In this republic, problems of medical ethics seem to have reached their fullest proportion. The Republic Party newspaper, Bakinskiy rabochiy, has referred to problems in this sector for many years, reaching to the time of the Azerbaydzhan Communist Party congresses in 1971 and 1976, and especially in January 1979. The extent of the unethical behavior appears to have been beyond all reports cited earlier. Aliyev, a Candiate Member of the Politburo of the Central Committee of the USSR and First Secretary of the Azerbaydzhan Communist Party, reported to the 43rd Baku Party Congress on January 24, 1979, that:

> The Azerbaydzhan Communist Party Central Committee has more than once pointed out serious shortcomings in the work of public health agencies, an indifferent attitude toward patients, and instances of bribery in hospitals, polyclinics, maternity homes and other medical institutions. Unfortunately, . . . slow to change . . . because executives of public health agencies . . . have not genuinely joined in an uncompromising struggle against self-seekers and grafters . . . A recent poll of a large number of working people and a checkup by . . . the republic Ministry of Internal Affairs brought to light new instances of bribery, the theft of medicine and food, violations of state and financial discipline, mismanagement and a criminally negligent attitude toward the use of medical equipment . . .[96]

And so on and on. On March 4th of 1979, the MVD Chief for the Republic, D. Veliev, reported on an examination of hospital practices. The investigation found financial irregularities, a high degree of corruption, hospital staffs which had been robbing and blackmailing patients and did not have accurate records of their stocks of medicines, premeditated violations of regulations, including four hospitals which had no record of 90 percent of their receipts of medicines and bandages during the past 9 months (in 1978), and so forth.[97] And on June 16, 1979, the Azerbaydzhan Central Committee explained the situation and their program for resolving the defects spoken about by Aliyev or published in the press. In addition to all the poor practices and unethical behavior cited earlier, this report included many new issues such as: poor organization of the work of pharmacies, serious shortcomings in preventive measures against infectious diseases, low compliance with sanitary standards at the "majority of the medical institutions themselves," little effort to correct unsanitary conditions at industrial enterprises, public catering, trade or other consumer service organizations, indifference to the decline in the number of skilled specialists, scornful attitudes by some toward "observance of the requirements of medical ethics, socialist legality and the principles of communist morality," criminal charges leveled against 81 health agency employees, the abetting of illegal actions by relatives and pulling of wires for them by the republic Minister of Health (G.M. Abdullayev), misplaced indulgence, ad infinitum.[98] One-and-one-half years later just shortly before Brezhnev's speech at the XXVIth Parth Congress, Aliyev acknowledged at the November 11, 1980 plenum of the Azerbaydzhan Central Committee that some improvements had been made but full resolution had not been achieved and that "extreme measures were necessary in order to rectify the situation."[99] Serious efforts are urgently needed to modify the individual and institutional behavior patterns elaborated here so that more efficient efforts can be directed toward reduction of mortality and morbidity, the prime business of a health system.

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[93] "A Writer Questions a Minister: The Working Person's Health," Literaturnaya gazeta, December 9, 1981, p. 13, translated in CDSP, vol. XXXIII, no. 51, January 20, 1982, p. 3.

[94] Comment of Vladimir Pozner, Radio Moscow (in English), 2300 gt, February 1, 1982, in BBC, Summary of World Broadcasts, USSR, SU/6956/B/3, February 17, 1982.

[95] S. Tutorskaya, "A Want of Compassion," Izvestiya, January 24, 1982, p. 3. excerpted in CDSP, vol. XXXIV, no. 5, March 1982, p. 4.

[96] G. A. Aliyev, "Militantly Fulfill Tasks Set by the Party," Bakinskiy rabochiy, January 27, 1979, pp. 1-4, in CDSP, vol. XXXI, no. 4, February 21, 1979, p. 13.

[97] D. Veliyev, "Opasnyy bolezn'," Bakinskiy rabochiy, March 4, 1979, cited in Radio Liberty, Current Abstracts and Annotations, Supplement to the Radio Liberty Research Bulletin no. 19, September 1979, p. 10.

III. MORBIDITY

The Soviet health system has marked major advances in reducing infectious diseases and other illnesses since 1917. Even as recently as the 1930's very high rates of certain infectious diseases were recorded. As a prime example, the highest number of cases of malaria was recorded as recently as 1934, when 9,477,007 were registered.[100] By 1965, the national total number of cases of malaria was 392, of which 201 were noted in the RSFSR and 123 in Azerbaydzhan, the remaining 68 were spread throughout the other Soviet republics.[101] Reduction in the number of cases of trachoma also was dramatic, decreasing from over 265,000 in 1959 to less than 10,000 in a five-year period (1964).[102] Diphtheria cases in 1955 and 1956 numbered between 145,000 and 150,000 in each year (a post-war peak), but has decreased to 350 in 1980.[103] Whooping cough totaled almost 800,000 cases in 1958, but is now 14,000 (in 1980).[104] From the viewpoint of domestic progress enormous strides have been made. But much remains to be done yet.

For comparison, data for similar categories of infectious diseases have been assembled for the period 1940 to 1979, and adjusted per 100,000 population in each country for each year of comparison. The current standard presentation of infectious disease data in the USSR includes 7 categories, from typhoid fever to measles. With the sole exception of scarlet fever, the Soviet data demonstrate very impressive reductions in the incidence of the diseases listed. In two cases, the rates per 100,000 population shown in table 1 are .1 or less in 1979 (diphtheria and acute poliomyelitis). The incidence and rate of scarlet fever is not very different from what was noted for 1940, but the recent direction is downward from the peak of 1960 shown in table 1. A similar downward direction is recorded for measles. However, when these and other figures are compared with the current US record, the Soviet pattern becomes more confusing and even worsens. For the United States, there has been an upturn in the recorded number of cases of typhoid fever, from 100 in 1960 to 500 in 1979. But the level and rate per 100,000 population is far lower than in the Soviet Union. The difference between 500 and 18,400 in the United States and the USSR, respectively, is so large that even the adjusted figure for different size of the population shows that the Soviet rate per 100,000 is more than 29 times higher than American rate per 100,000 population. The Soviet incidence of measles is slightly lower than the US in 1960, 383,000 to 442,000, but the rates are 6.2 per 100,000 (U.S.) and 145 per 100,000 (USSR) in the two countries. This leaves the Soviets at 23 times larger than the United States with a growing relative ratio in all years since 1950.

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[98] "In the Azerbaydzhan Communist Party Central Committee," Bakinskiy rabochiy, June 16, 1979, p. 2, excerpted in CDSP, vol. XXXI, no. 31, August 1979, pp. 9–10

[99] Elizabeth Fuller, "Aliev Speaks on Economic Success and Social Problems," Radio Liberty Research, RL 463/80, December 5, 1980, pp. 1 and 6–7.

[100] O. V. Baroyan, Itogi poluvekovoy bor'by s infektsiyami v SSSR i nekotoryye aktual'nyye voprosy sovremennoy epidemiologii, Moscow, Meditsina, 1968, p. 77.

[101] Ibid., p. 83.

[102] Ibid., p. 87.

[103] Ibid., p. 97 and Nar. khoz. v 1980, p. 499.

[104] Baroyan, Itogi, 1968, p. 104 and Nar. khoz. v 1980, p. 499.

INFECTIOUS DISEASES, SELECTED CAUSES, U.S.S.R.—1940, 1950, 1960, 1970, AND 1979

Type of disease	1940	1950	1960	1970	1979
Number of cases (in thousands)					
Typhoid and paratyphoid (A, B, C)	121.3	48.3	47.3	22.5	18.4
Scarlet fever	251.5	596.1	671.2	469.9	245.8
Diphtheria	177.0	83.9	53.2	1.1	.2
Whooping cough (pertussis)	453.3	315.1	554.1	39.5	25.2
Tetanus	(1)	2.1	2.3	.6	.4
Poliomyelitis, (acute)	1.3	2.6	7.2	.3	.2
Measles	1,181.9	1,045.9	2,083.3	471.5	382.6
Rates per 100,000 population:					
Typhoid and paratyphoid (A, B, C)	62	27	22	9	7
Scarlet fever	129	331	313	194	93
Diphtheria	91	47	25	.45	.10
Whooping cough	232	175	259	16	10
Tetanus	(1)	1.2	1.1	.27	.15
Poliomyelitis, (acute)	.7	1.4	3.3	.11	.08
Measles	605	581	972	194	145

[1] Not available.

Sources: 1940, 1950, and 1960: Nar. khoz. v 1967, p. 851 and 1970 and 1979: Nar. khoz. v. 1980, p. 499.

INFECTIOUS DISEASES, SELECTED CAUSES, U.S.—1940, 1950, 1960, 1970, AND 1979

Type of disease	1940	1950	1960	1970	1979
Number of cases (in thousands):					
Typhoid fever	9.8	2.5	0.1	0.3	0.5
Scarlet fever	(1)	(1)	(1)	(1)	(1)
Diphtheria	15.5	5.8	.1	.4	.1
Whooping cough (pertussis)	183.9	120.7	14.8	4.2	1.6
Tetanus	(1)	0	0	.1	.1
Polio, (paralytic)	9.8	(1)	2.5	0	0
Measles	291.2	319.1	441.7	47.4	13.6
Rates per 100,000 population:					
Typhoid fever	(7.4)	(1.6)	(.06)	.17	.24
Scarlet fever	(1)	(1)	(1)	(1)	(1)

Footnote at end of table.

INFECTIOUS DISEASES, SELECTED CAUSES, U.S.—1940, 1950, 1960, 1970, AND 1979—Continued

Type of disease	1940	1950	1960	1970	1979
Diphtheria	(11.7)	(3.8)	(.06)	.21	.03
Whooping cough	(138.8)	(79.5)	(8.4)	2.08	.74
Tetanus	(1)	0	0	.07	.04
Polio, (paralytic)	(7.4)	(1)	(1.4)	02	.01
Measles	(219.8)	(210.1)	245.4)	23.4	6.2

[1] Not available.

Sources: Center for Disease Control, MMWR, annual summary 1979, and vol. 28, No. 54 (September 1980), pp. 12-17.

RATIO OF U.S.S.R./U.S.—RATES PER 100,000 POPULATION

Type of disease	1940	1950	1960	1970	1979
Typhoid fever	8.4	16.9	366.7	52.9	29.2
Scarlet fever	(1)	(1)	(1)	(1)	(1)
Diphtheria	7.8	12.4	416.7	2.1	3.3
Whooping cough	1.7	2.2	31.6	7.7	13.5
Tetanus	(1)	(1)	(1)	3.9	3.75
Polio (acute: paralytic)	.1	(1)	2.4	5.5	8
Measles	2.8	2.8	4.0	8.4	23.4

[1] Not available.

Source: Table 1 rates divided by table 2 rates.

It is not fully certain, however, how to evaluate the data on number and rate of infectious diseases when alternative evidence exists that special medical surveys of the population reveal figures twice as high between those registered as sick based on visits to medical facilities and the figures derived from these special surveys. Thus, the overall rate of illness among the urban population (per 1,000 population) based on patient visit data was 1,069.9 per 1,000 males and 1,196.9 per 1,000 females; based on medical exams the figures should be 2,048.7 and 2,447.7, respectively. By age group, standardized by structure of the urban population according to the 1970 census of population, the morbidity rate was 1,110.5 males (instead of 1,069.9) and 1,205.0 females (instead of 1,196.9); medical exam data, however, demonstrated a rate of 2,112.5 males (instead of 2,048.7) and 2,291.0 females (instead of 2,447.7).[105] For the age group 0–4 years old, the figures for visit and exam rates, for males and females, respectively, are 2,087.2 and 2,562.0 males and 2,051.5 and 2,382.4 females. Among the largest discrepancies between visit data and exam data are those for congenital birth anomalies, much higher than the approximately twice for the overall rates. Thus, for males the discrepancy is between 3.5 and 26.3 per 1,000 population, or 7.5 times higher "in reality". For females 2.9 and 16.8 per 1,000 population yields a real figure 5.8 times higher. Infectious and parasitic diseases—more closely related to table 1-type data—shows a discrepancy of 70.2 per visit data and 133.3 per exam data for males, and 71.3 and 104.4 for females.[106]

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[105] A. A. Romenskiy, "Obshchaya zabolevayemost gorodskogo naseleniya (po materialam kompleksnogo izucheniya sostoyaniya zdorov'ya naseleniya provedennym v 1969–1970 gg.)," Sovetskoye zdravookhraneniye, no. 6, June 1978, pp. 15–17.

[106] Ibid., p. 15.

Similar overall data for the rural population are not available as far as I am aware. Nonetheless, the thrust of these relative differentials between recorded numbers and "real" numbers would imply that the health status of the Soviet population is far more difficult than shown by the standard morbidity data.

In regards to the health of young people several contradictory statements can be compared for present purposes of an overview of selected issues on Soviet health conditions. Thus, Izvestiya in 1978 published a statement claiming that in recent years the health of preschool age children has shown considerable improvement.[107] Petrovskiy, the former Minister, affirms that the pneumonia rate among children up to age 3 has decreased from 85.3 per 1,000 children in 1975 to 81.1 in 1978, of which for children 0–1 years of age, from 110.4 to 99.8, respectively.[108] These figures stand in contrast, but not necessarily in contradiction to the statement by Bednyy, cited above, that in the last decade there has been more children born with congenital birth anomalies,[109] that in the RSFSR in the 5 years preceding one report (published in 1978), the level of acute upper respiratory channel illnesses grew by about one-third among children in both urban (37.5 percent) and rural (31.0 percent) child-care institutions. Acute respiratory virus infections and influenza comprise 70–80 percent of all child illnesses.[110] Perhaps Petrovskiy's report is correct for the country as a whole, but it seems to contradict the evidence for the largest component republic of the country.

One of the most startling pieces of evidence regarding the health of young people is the 1980 report by Sokolova (of the First Leningrad Medical Institute) that in Leningrad—a city one would expect to have one of the better health delivery systems—that "in practice" only 42.2 percent of all 5-year olds were healthy. Further, 41.7 percent were frequently ill with acute respiratory illnesses and 16.1 percent either were seriously ill, injured, chronically ill, or had developmental anomalies.[111] A survey of 450 families in Leningrad with children up to 7 years of age, found that 6.3 percent of these children suffered from rickets and hypertrophy![112] As far as I know, the United States no longer collects data on rickets, a vitamin D nutritional deficiency. Evidence on the prevalence of rickets among rural children is available. Among these children respiratory illnesses, especially pneumonia, occurred 1.7 times as frequently than among those not suffering from rickets.[113] This level of illness rate among young children must contribute to the reported 30 million Soviet citizens suffering from influenza each year on the average.[114]

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[107] Izvestiya, September 14, 1978, p. 1.

[108] Petrovskiy, Novyy, 1981, p. 162.

[109] Bednyy, Mediko-, 1979, p. 128.

[110] "Ob uluchshenii raboty po profilaktike ostrykh respiratornykh virusnykh infektsiy i grippa v doshkol'nykh uchrezhdeniyakh RSFSR," Sbornik prikazov i instruktsii Ministerstva prosveshcheniya RSFSR, no. 10, October 1978, p. 12.

[111] N. S. Sokolova, "Voprosy izucheniya iskhodov beremennosti u zhenshchin," Zdravookhraneniye Rossiyskoy Federatsii, no. 3, March 1980, p. 14.

[112] N. G. Veselov, "O metodike mediko-sotsial'nogo obsluzhivaniya sem'i rebenka," Ibid., no. 8, August 1979, p. 13.

[113] R. Kalancha, "Zabolevayemost' detey pervogo goda zhizni prozhivayushchikh v sel'skoy mestnosti," Sovetskoye zdravookhraneniye, no. 8, August 1980, p. 26.

[114] Ye. Nilolin, "Gripp: Syuprizov ne budet," Trud, October 29, 1981, p. 4.

Very revealing reports have been published lately about the negative impact on children of alcoholic parents in the Soviet Union. A sociological and medical survey of 45 chronically alcoholic women conducted by the Moscow Psychiatric Research Institute found "extremely serious consequences (osobo tyazhelymi posledstviyami) for their offspring".[115] Of the 291 pregnancies conceived by these women, only 118, or 40.5 percent were born healthy, 54 were medically aborted, miscarriages or still-born, 97 were born mentally retarded, and 22 died in their first 2 years of life.[116] Thus, of the 237 children born alive, 41.0 percent were mentally retarded, a figure almost as high as the proportion of healthy children (45.6 percent, i.e., 118/237). The research of B. and M. Levin reported in 1978 and 1979 found that the rate of alcoholism was growing faster among women than among men, that women's sections had to be opened in sobering-up stations and psychiatric hospitals, that alcohol consumption was increasing among widows, divorcees and single women, and that young females were drinking earlier.[117]

A remarkably frank article was published in the newspaper Cina, by V. Strazdins, the Chief Narcotics Expert of the Latvian Ministry of Health on September 23rd of last year. This piece noted the increase in absolute volume of consumption, the growing share of hard liquor among all alcohol consumption, the high proportion of all expenditures on alcohol relative to consumer goods, and the impact on individual adults and the dramatic impact on their children—including their intellectual capabilities.[118] The statement, in full, is as follows:

> Widespread drunkenness and alcoholism still cause immense moral and material harm to our families and society. For the time being we still have not managed to stop a further spread of drunkenness and alcoholism . . . In 1980, the sale of alcoholic beverages was 80 percent up on 1970. Although in respect to the per capita consumption of alcohol our republic is surpassed by France, Italy, Hungary, Austria, Czechoslovakia and Belgium, it is alarming that it is mostly strong alcoholic beverages that are being consumed here; these are much more dangerous because one becomes accustomed to them more rapidly. Meanwhile, the consumption of beer in our republic is diminishing each year, and is considerably lower than in Estonia and Lithuania.
>
> The consumption of alcohol in our republic is increasing, especially among the families of collective farm workers from 1970 to 1977 it increased by 30 percent, whereas among the families of workers it increased by 10 percent. Rates of increase of this kind are caused by the improvement of the material situation of people in rural areas in recent years, and by a certain cultural backwardness and uniformity which still persist in everyday social life. In 1980, each inhabitant spent on average R226 on alcoholic beverages, as much as the average inhabitant paid for cloth, clothing, underwear, and socks and stockings, taken together.
>
> Unfortunately, behind every litre of alcoholic beverages consumed are hidden immense social and biological consequences. Drunkenness and alcoholism cause the state immense economic losses . . . It is especially alarming that those who die are predominantly men in the most productive years of their working lives, who could have produced a great deal more. The losses expressed in terms of money considerably exceed the revenue from sales of alcoholic beverages: one rouble of revenue causes a loss of a rouble and a half . . . It is most horrible that drunkenness and

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[115] V. M. Lupandin, "Alkogolizm i potomstvo," Sotsiologicheskiye issledovaniya, no. 1, January-February 1980, p. 96.

[116] Ibid., p. 97.

[117] See B. Levin and M. Levin, "Women's Drinking," Literaturnaya gazeta, December 20, 1978, p. 12, translated in CDSP, vol. XXXI, no. 3, February 4, 1979, pp. 5-6, and B. Levin and M. Levin, "The Very First Glass—Some Sober Thoughts About Drunkenness," Sovetskaya kul'tura, February 9, 1979, p. 6, abstracted in CDSP, vol. XXXI, no. 12, April 18, 1979, p. 13.

[118] BBC, Summary of World Broadcasts, USSR, SU, 6847/B/2-3, October 7, 1981.

> alcoholism not only ruin a person's physical health but, chiefly, deform his character and intellect. Quite frequently the children of alcoholic parents suffer from various degenerative diseases and mental backwardness, and thereby the number of mentally inferior people in our society increases.

According to the information provided Dr. Allen Greenberg, former Science Counsellor at the U.S. Embassy, Moscow, at the time of the World Health Organization conference on Primary Health Care held in Alma-Ata, Kazakhstan, in 1978, about 50 percent of all hospital beds were occupied by persons whose illness was associated with alcohol-related problems.[119] Figures such as this and reports by leading economists such as that by Abel Aganbegyan, the head of the Institute of Economics and Organization of Industrial Production in Novosibirsk, that in many of the plants throughout the country which he visited special brigades are formed to keep workers who show up for work drunk away from the now complex and very expensive machinery. Given its impact on productivity in addition to the social and medical costs the prevalance of such brigades described by Aganbegyan in the national trade union newspaper last year is very serious indeed.[120] The Ministry of Health of the USSR has developed a "Long-Term Program for Scientific Research on Problems of Alcoholism in 1976–1980", in conjunction with the Academy of Medical Sciences.[121] Also consideration has been given, but rejected, to ban the sale of liquor, i.e., prohibition. According to Komsomol'skaya pravda, the newspaper of the Young Communist League, it is feared that samogon (moonshine) would make such a ban ineffective. The December 1919 resolution in the RSFSR on prohibition was circumvented by increases in production of samogon. Thus, in 1922 9,400 cases of moonshining were discovered; in 1924, the number was 275,000.[122] This issue is of the moment because the Deputy Chairman of the USSR Supreme Court, Yevgeniy Smolentsev, reporting on Moscow Home Service on April 5, 1982 about the proceedings of the plenum of the Court, stated that:

> It is with great regret that one is forced to admit that in recent years the consumption of spirits has not been going down, but up, that in a number of places the production of home-distilled liquor has become more widespread. . . . It leads to lost working hours, a reduction in productivity, an increase in defective output and a growth in injuries and accidents. . . . Drunkenness also damages people's health and causes harm to the family. . . . The demon drink is an unseen presence in the dock at the majority of court cases . . .[123]

The importance of the alcohol issue to the health of Soviet society appears to be very serious and of growing concern to the leadership. This issue, as well as those outlined here on medical supplies, equipment, facilities and ethics, clarify Brezhnev's statement at the Party Congress. They indicate the underlying bases for the unusually strong negative remarks he made about one of the areas which the Soviet regime has long—and to a large degree correctly—been praised. Its present status, however, leaves much to be desired in its trend and urgency given population and manpower trends which necessitate by itself an even healthier population.

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[119] Personal communication.

[120] A. Aganbegyan, "Do All That You Can," Trud, October 17, 1981, p. 2, translated in JPRS, USSR Report, Human Resources, no. 45, JPRS 79577, 3 December 1981, p. 5.

[121] N. Ya, Kopyt, "Izucheniye alkogolizma kak sotsial'no-gigiyenicheskoy problemy (metodicheskiye podkhody, opyt, perspektivy)," Zdravookhraneniye Rossiyskoy Federatsii, no. 8, August 1980, p. 3.

[122] Response to letter, in Komsomol'skaya pravda, February 19, 1982, p. 2.

[123] "USSR Supreme Court Plenum on the Problem of Drunkenness," Moscow Home Service, 0910 gmt, 5 April 1982, A forthcoming book by Vladimir G. Treml, Alcohol in the USSR, A Statistical Study, Durham, NC, Duke University press, 1982, provides unique estimates of the amount and composition of alcohol consumption in the Soviet Union. Separate estimates are made for official and samogon production, in absolute amounts and in pure alcohol equivalents per capita.

THE ECONOMICS OF THE SOVIET HEALTH SYSTEM

By Christopher Davis*

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I. INTRODUCTION

The rise in death rates in the USSR since 1965 has stimulated a re-examination of both health conditions and the system of medical care in the Soviet Union.[1] Western specialists have wanted, for sci-

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[1] Among the papers devoted to the problem of mortality in the USSR are Davis, 'An Analysis', 1977; Dutton, 'Changes', 1979; Davis, 'The Economics', 1979; Davis and Feshbach, 'Rising', 1980 and Cooper, 'Rising', 1981.

The Soviet Union is not the only socialist society to have experienced rising mortality. In Davis, 'The Polish', 1982 this author showed that most adult age specific death rates in Poland have risen by over 10% from 1970 to 1980.

entific reasons, to understand better the causes of the unusual phenomenon—increasing mortality.[2] But for the Soviet citizens this is not an academic problem, rather it is one which affects their welfare and influences their perception of the efficacy of the state's social and economic policies. The leadership in the USSR is obviously concerned by the poor health situation. The Central Committee of the Communist Party of the Soviet Union and the Council of Ministers USSR issued a joint decree on August 26, 1982 entitled 'Supplemental measures for improving the population's health protection'. However the question remains whether the Soviet leaders are prepared to alter national priorities and reallocate sufficient resources to alleviate the health crisis at a time when the economy is under considerable strain.

The objective of this paper is to analyze the response of the Soviet health system since 1965 to the deterioration of health conditions and the emergence of a more complex illness patern.[3] Special attention is paid to economic issues because of their influence on health organization, the output of medical services and the quantity and quality of inputs to the health sector.

Part II of the paper argues that Soviet priorities and problems in economic planning and management have influenced the development of the health sector. A brief economic history of the sector is presented to support this point. It is shown that the current health system has been organized in accordance with the state's non-egalitarian distributional philosophy. As a result, it provides medical care of varying quality to different population groups.

The health production process is examined in more detail in Part III. An evaluation of the output of medical services in the USSR reveals that most basic quantitative indicators have improved since 1965. The inputs of labor, buildings, medical equipment, medicines and other commodities have increased as well.

In Part IV there is a summary of aggregate health finance trends and an evaluation of the effects of financial constraints on medical performance. It is shown that there are numerous shortages of inputs and bottlenecks in the health production process which diminish the efficiency of resource utilization and the quality of medical care. Recent efforts to reform health planning and management have had limited beneficial influence.

Part V summarizes findings and argues that although there have been improvements in Soviet medical care since 1965 they have been insufficient to offset unfavorable developments in health conditions and illness patterns. The health system therefore bears some responsibility for the rise in mortality rates.

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[2] Davis, 'The Economics', 1979; Davis and Feshbach, 'Rising', 1980; Berliner, Schwalberg and Davis, 'The Economics', 1981; Cooper, 'Rising', 1981; Cooper and Schatzkin, 'Recent', 1982; and M. Feshbach, 'Issues in Health Problems' in this volume.

[3] This author appreciates that considerable academic controversy exists about the definition of 'health', the measurement of health status, and the importance of medical services in preventing or curing illness. The decision to focus on the health system in this paper does not imply acceptance of a mechanistic model of health production. For a more complete discussion of these complex issues see Davis, 'The Economics', 1979 and Berliner, Schwalberg and Davis, 'The Economics', 1981.

II. ECONOMIC INFLUENCES ON SOVIET HEALTH SECTOR DEVELOPMENT

A. THE ECONOMY AND THE HEALTH SECTOR

National priorities, economic planning problems and the state of the economy in the USSR have an important influence on the development of the medical care system. These political and economic factors determine the resource constraints on the health sector and its ability to provide medical services to the population.

The Soviet leaders have always adopted ambitious economic goals to encourage rapid development and to motivate the population. In any given period, however, the requirements of goal attainment exceed resources available. In order to cope with this problem the leadership establishes priorities to govern resource allocation.[4] It has traditionally attached greatest importance to end-uses such as defense and investment and to sectors such as heavy industry. Of lesser significance have been the consumer goods industries, the health sector and most other branches of the "non-productive sphere".[5]

On the basis of information about the leadership's goals and priorities, plus the current state of the economy, five-year and one-year plans are drawn up by Gosplan.[6] These plans are detailed for key commodities and sectors but are vague for many others. For example, in national economic plans the summary indicators used for the health sector are the number of hospital beds, the capacity of polyclinics (measured by the number of patient visits per shift), and the number of doctors' positions.[7] Through use of financial norms the Ministry of Finance calculates plan-linked budgets.

Soviet economic plans are only a 'vision of the future' and not a feasible program for economic development.[8] The plans are always inconsistent at formulation because of overambitious goals, unrealistic assumptions, planners' errors, and limitations on information processing.[9] Because of the consistency problems shortages of commodities and labor and bottlenecks in production arise as plans are implemented.[10] Unexpected events such as harvest failures and international crises further destabilize the plans.

In order to cope with this characteristic instability of plans Communist Party leaders have to intervene continuously to revise plans and redirect resources. In altering allocations reference is again made to national priorities. The most important sectors suffer least from shortages. But in consequence the constraints in other areas grow tighter and the original plans become more difficult to fulfill.

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[4] See Zaleski, 'Stalinist', 1980; Ellman, 'Planning', 1973 and Kornai, 'Economics', 1980 for discussions of the characteristics of centrally planned economies. Statements in this paper about Soviet priorities are more hypotheses than research conclusions. Additional theoretical and empirical work is needed on the definitions and measurement of priorities in socialist economies.

[5] According to traditional Soviet economic theory the economy can be divided into productive and non-productive spheres. The former, which includes industry and agriculture, produces commodities with value and thereby national income. The non-productive sectors, such as health, education and the military, engage in 'redistribution, exchange and consumption of material wealth and national income'. Soviet leaders have considered the development of the productive sphere, especially heavy industry, as the highest priority task. But the nonproductive activity of national defense has also received generous support. See Rutgaizer, 'Resursy', 1975 and Solodkov, 'Ekonomika', 1980.

[6] Gosplan, 'Metodicheskie', 1980 and Ellman, 'Planning', 1973.

[7] Gosplan, 'Metodicheskie', 1980, pp. 730–733.

[8] Zaleski, 'Stalinist', 1980, Chapter 19.

[9] Ellman, 'Planning', 1973.

[10] Kornai, 'Economics', 1980.

The preceding discussion suggests that the Soviet health sector is subject to both designed and accidental constraints. The former are imposed at the time of plan formulation and reflect the leadership's desires and the chosen socio-economic development program. The latter are the result of faulty plan implementation and unexpected shortages.

Because the health system in the USSR operates in the unstable environment of a shortage economy it is afflicted by production bottlenecks which lower the quantity and quality of medical services. Administrators never have enough resources to cope with all the demands of the population for medical care and encounter difficulty in ensuring even the planned volume of services. The relative inadequacy of resources means that decisions have to be made about which categories of patients to treat. Rationing schemes are developed to ensure that the most important members of the Soviet population receive appropriate medical care irrespective of the chronic disruptions.

B. THE ECONOMIC HISTORY OF THE HEALTH SYSTEM

The relationship between the Soviet economy and the health sector can be clarified through historical analysis. In this section economic influences on health system development since 1977 are evaluated.[11]

The health system which the Bolshevik regime inherited was inadequate to meet even the minimal needs of the great majority of the population. Most doctors and hospitals were located in the large cities of European Russia and served a small segment of more affluent urban inhabitants. Immediately after the October Revolution there was heated debate about how to construct an egalitarian, socialist health system and some radical decrees were published. However, any changes were more symbolic than real because the Bolshevik state did not have the resources to support new programs. After the start of the Civil War in 1918 available medical supplies and personnel were devoted to two major tasks—the prevention of epidemics of infectious diseases and the provision of medical care to the Red Army.

By the end of the Civil War in 1921 many pre-revolutionary medical facilities had been destroyed and there were severe shortages of all types of supplies. The situation was made worse the following year when the government drastically cut back public expenditures in an attempt to correct the monetary and fiscal problems caused by the transition from War Communism to the New Economic Policy. From January to July 1922, at a time of famine and severe epidemics, the number of hospitals in the RSFSR was cut by 16 percent and hospital beds by 29 percent.[12]

The inadequacy of the public health system in the early 1920's stimulated those with power in Soviet society to develop forms of rationing available medical care to their advantage. The closed subsystems of the Party elite (established in 1919) and the Red Army were joined by that of the People's Commissariat of Railroads in 1922.[13] Other Commissariats were temporarily prevented from following this example. However, the trade unions, which controlled about 50 percent of health finance, ensured that their member benefited from relatively high health expenditures and had priority access to public medical facilities. In 1926/27 annual per capita health spending on members of insured workers' families in urban areas (11 percent of the population) was 21.85 rubles, whereas that on the non-insured rural population (about 80 percent of the population) was 1.08 rubles.[14]

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[11] This section is based upon earlier work by this author on the economic history of the Soviet health system. See Davis, 'Economic', 1978 and Davis, 'The Economics', 1979.

[12] Davis, 'Economic', 1978, pg. 10 and Wheatcroft, 'Famine', 1981.

With the 'great turnaround' (velikii povorot) in the health sector in 1929 and the purge of those administrators identified with egalitarian health policies, organizational diversity and differential access to medical facilities increased.[15] Many more Commissariats obtained their own departmental medical facilities. In the 1930's people without access to a closed subsystem were able to use 'public' medical facilities. But a series of decrees in the early 1930's established priorities for the treatment of patients on the basis of socio-economic categories.

Other features of the Stalinist system affected the development of the health sector. As a branch of the 'non-productive sphere' the health system had a low priority claim to resources, as did the sectors supplying it such as the pharmaceutical and medical equipment industries. The chronically overambitious and inconsistent national economic plans, the strict censorship of statistical information and the fragmentation of control of medical facilities between ministries made rational health planning virtually impossible throughout the Stalinist era. In reflection of the state's priorities, medical wages were kept low and the share of women in the medical labor force grew. Throughout the Stalinist period this disorganized and resource-starved system of medical care had to cope with a series of public health catastrophes caused by the rural famines of 1931–33, the decline in urban living standards, the rapid growth of concentration camp populations in remote regions, the Nazi invasion and occupation, and the harsh post-World War II reconstruction and armaments programs.[16]

Since the mid-1950's the Ministry of Health USSR has received more generous allocations of resources and has gradually gained control of more of the departmental medical facilities. However the Soviet leadership's economic priorities have changed slowly from those of the past. As a result the health system has remained subject to tight constraints which undermine medical performance. Further, many of the more powerful ministries have managed to resist the consolidation policy, so the Soviet Union in the 1980's still has a system of medical care which is neither completely unified nor egalitarian.

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[13] A closed health system is one designed to serve a selected population group, such as workers in a specific ministry or factory. These medical facilities are not open to the public. See Davis, 'Economic', 1978, pp. 13–14 and Ministerstvo Zdravookhranenie, 'Problemy' 1969 for information about the early development of the elite health system.

[14] Davis, 'Economic', 1978, p. 28.

[15] Ibid., pp. 61–68.

[16] Wheatcroft, 'Famine', 1981 and Wheatcroft, 'On Assessing', 1981.

C. THE CURRENT ORGANIZATION OF MEDICAL CARE

In theory the Soviet Union has a unified health system which is fully owned, scientifically planned and generously financed by the State, and one which provides a full range of modern medical services free-of-charge to all the population. However, analysis of available evidence calls into question the validity of certain Soviet claims, especially those concerning the unified and egalitarian nature of the system.[17] In reality there are several health subsystems which provide medical care of differing quality to a variety of population groups.

The current structure of the Soviet health system is shown in Diagram 1. There are six types of legal subsystems of medical care in the USSR. Five of these are administratively subordinate to the Ministry of Health USSR: elite, capital city, provincial city, industrial and rural. The departmental subsystem is controlled by other ministries or organizations. A more detailed description of these subsystems and estimates of the populations served by each are given elsewhere.[18] In this paper, only a summary of the current organization is provided.

A large number of Soviet medical facilities are outside the public sector and serve members of the population who are affiliated to important organizations. Among those which have closed polyclinics for their members are the Ministries of Foreign Trade, Finance, Higher and Intermediate Education, Foreign Affairs, the Aviation Industry and the Academy of Sciences. The Ministry of Defence maintains its own complete system of medical care, as do the K.G.B. and the M.V.D. The Ministry of Railroads has an extensive system of at least sixteen hospitals which is run by its Main Medical-Sanitary Administration. As one might expect, the Ministries of Merchant Marine has a special system of clinics and hospitals for its sailors, as does the Ministry of Civil Aviation.[19] The level of medical care in the departmental subsystem is on average higher than that found in the public sector because the economic and political significance of the controlling organizations ensures better access to available resources.

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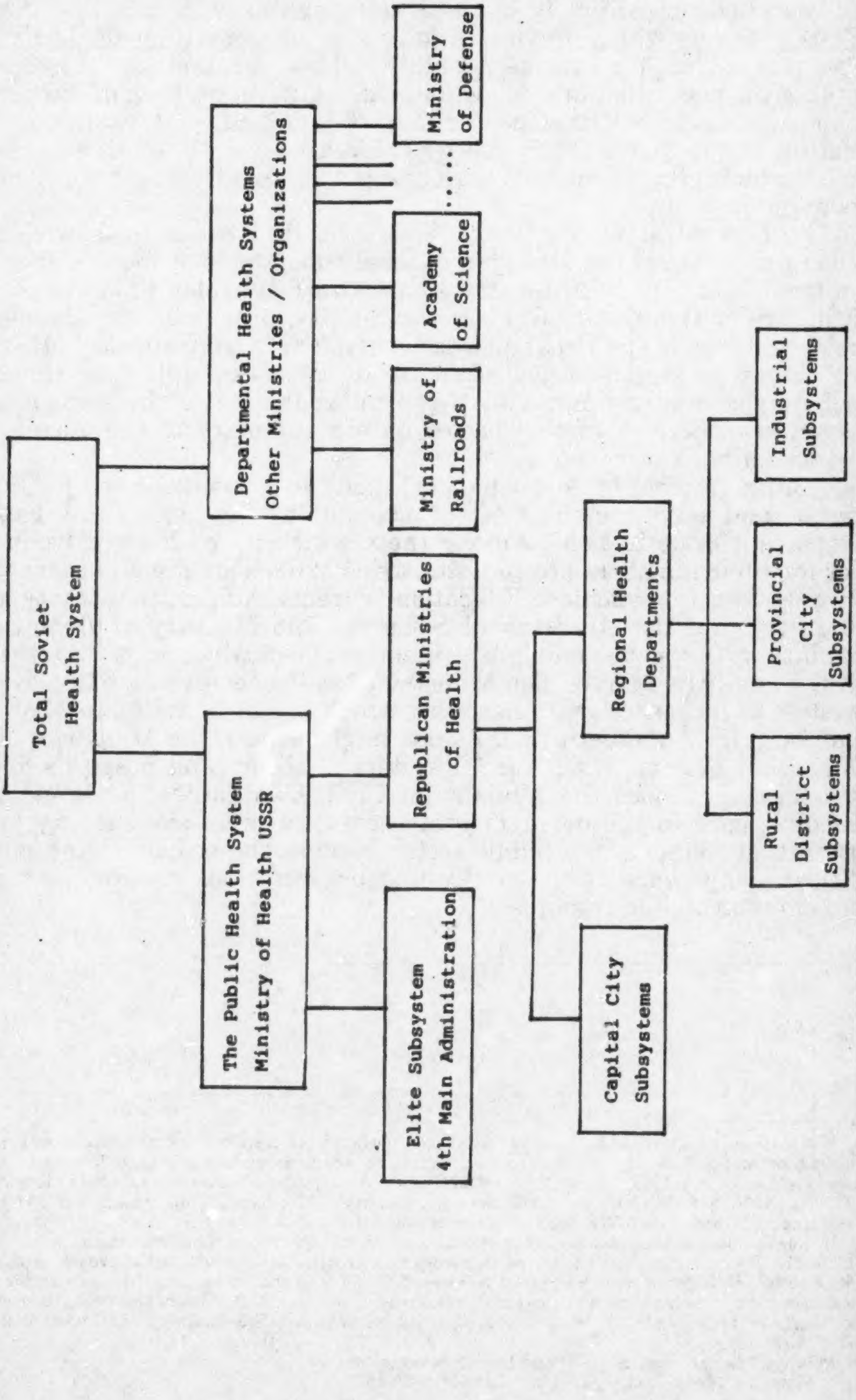
[17] Numerous Western and Soviet authors have outlined the health principles, organization, legislation and policies of the USSR so no attempt is made to reproduce this basic information. See Field, 'Soviet', 1967; Hyde, 'The Soviet', 1974; Vinogradov, 'Rukovodstvo', 1974; Kaser, 'Health', 1976; Safonov, 'Osnovy', 1976; Serenko, 'Osnovy', 1976; Ryan, 'The Organisation', 1978 and Knaus, "Inside', 1981. The book by Kaser is especially useful.

In considering the issue of equality in the USSR it should be kept in mind that since the early 1930s the Soviet regime has supported in theory and practice a differentiated approach to the distribution of wages, income and social services. It is believed that under socialism inequalities are necessary in order to provide material incentives to workers. Distribution according to need will only be appropriate in the future, under full communism. See McAuley, 'Economic Welfare', 1979.

[18] Davis, 'The Economics', 1979 and Davis, 'Soviet', 1982.

[19] Matusov, 'Meditsinskoe', 1971 and Zabin, 'Puti', 1982.

DIAGRAM 1 : The Subsystems of Medical Care in the USSR


Total Soviet Health System
Departmental Health Systems Other Ministries / Organizations
Ministry of Railroads
Academy of Science
.....
Ministry of Defense
The Public Health System Ministry of Health USSR
Republican Ministries of Health
Elite Subsystem 4th Main Administration
Regional Health Departments
Capital City Subsystems
Rural District Subsystems
Provincial City Subsystems
Industrial Subsystems

The majority of medical establishments are administered by the Ministry of Health USSR and the fifteen republican ministries. Although this public system is unified in the sense that it is subordinate to one Ministry, a number of distinct sybsystems co-exist which serve different population groups with varying standards of medical care.

The easiest of these to define is the one which is devoted to the care of members of the Soviet party/government elite and their families. This subsystem is administered by a branch of the Ministry of Health called the Fourth Main Administration. It has grown considerably from its modest dimensions in the 1920s. No longer does it serve only people working in Moscow. Each of the republican ministries administers elite medical facilities located in its territory. From published Soviet sources twelve hospitals, eight polyclinics, one laboratory, one research institute and fifteen sanitoria of the Fourth Main Administration can be identified.[20]

Available evidence suggests that the elite medical facilities are well-supplied with modern Soviet and foreign medicines and equipment and staffed by the best medical personnel in the USSR. As a result of the generous allocation of resources to these facilities the quality of its medical care is reported to be high.

Most Soviet citizens receive their medical care in one of the other four subsystems of the Ministry of Health. The best of these, the capital city system, is directly subordinate to the republican ministries, whereas the others are administered by regional (oblast) health departments. The industrial subsystem, which is partially supported by contributions of specific factories and open only to their workers, tends to provide better medical care than that of the provincial city. Both are superior to the backward rural subsystems.

Two other factors should be mentioned which significantly affect the quality of medical care received by Soviet patients. The first is the regional disparities in the USSR. Major differences exist between republics and regions in standards of living, health conditions and availability of medical resources. As a result the quality of medical care provided in health subsystems of a given type can vary widely.[21] For example, a rural district health system in Tadzhikistan would be significantly inferior to one in Estonia.

A second factor is private medicine. Although some legal fee-for-service outpatient clinics exist in the USSR most private transactions in the medical sphere are illegal. The main features of the Soviet second economy are described elsewhere by Grossman.[22] Knaus has presented interesting information about its role in medicine.[23] In general illegal private practice exists within the various subsystems, not outside them. Doctors, nurses and other staff supplement their low wages by accepting side payments from patients, which are made to secure rapid admission to better public hospitals, treatment by top specialists, improved dental work, medicines in short supply, discreet treatment of socially embarrassing medical conditions and more considerate care in hospital wards.

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[20] Ministerstvo Zdravookhranenie, 'Problemy' 1969 and Ministerstvo Zdravookhranenie, 'Sbornik', 1966.

[21] For estimates of the distribution of the Soviet population between health subsystems and regions see Davis, 'Soviet', 1982

[22] See Grossman, 'Studies,' forthcoming.

[23] Knaus, 'Inside', 1981.

III. THE HEALTH PRODUCTION PROCESS IN THE U.S.S.R.

Whatever the economic environment and organization of a health system, its major function is to produce medical services to prevent or cure illness using various types of inputs. In Section A the general health production process is described. This is followed by an assessment of the output of medical services in the Soviet Union from 1965. In Section C the inputs to the Soviet health system are evaluated.

A. THE HEALTH PRODUCTION PROCESS

The production of health is governed by a complex process involving health conditions, illness patterns, medical services and health sector inputs.[24] A simplified representation of this process is shown in Diagram 2. Health conditions and preventive medical services interact to generate the illness pattern. A portion of the total illness is presented to the health system for treatment.[25] Curative medical services are provided which influence the outcomes of illness. The production of the various medical services requires inputs of labor, medicines, equipment and buildings.

Among health economists considerable confusion exists about how one should evaluate the health production process because of the difficulty in defining and measuring outputs. A common mistake has been to employ input measures of output.[26] Measuring the outcome of medical activities by the number of doctors or hospital beds available is as sensible as measuring the output of the steel industry by the number of tons of iron ore used in production.

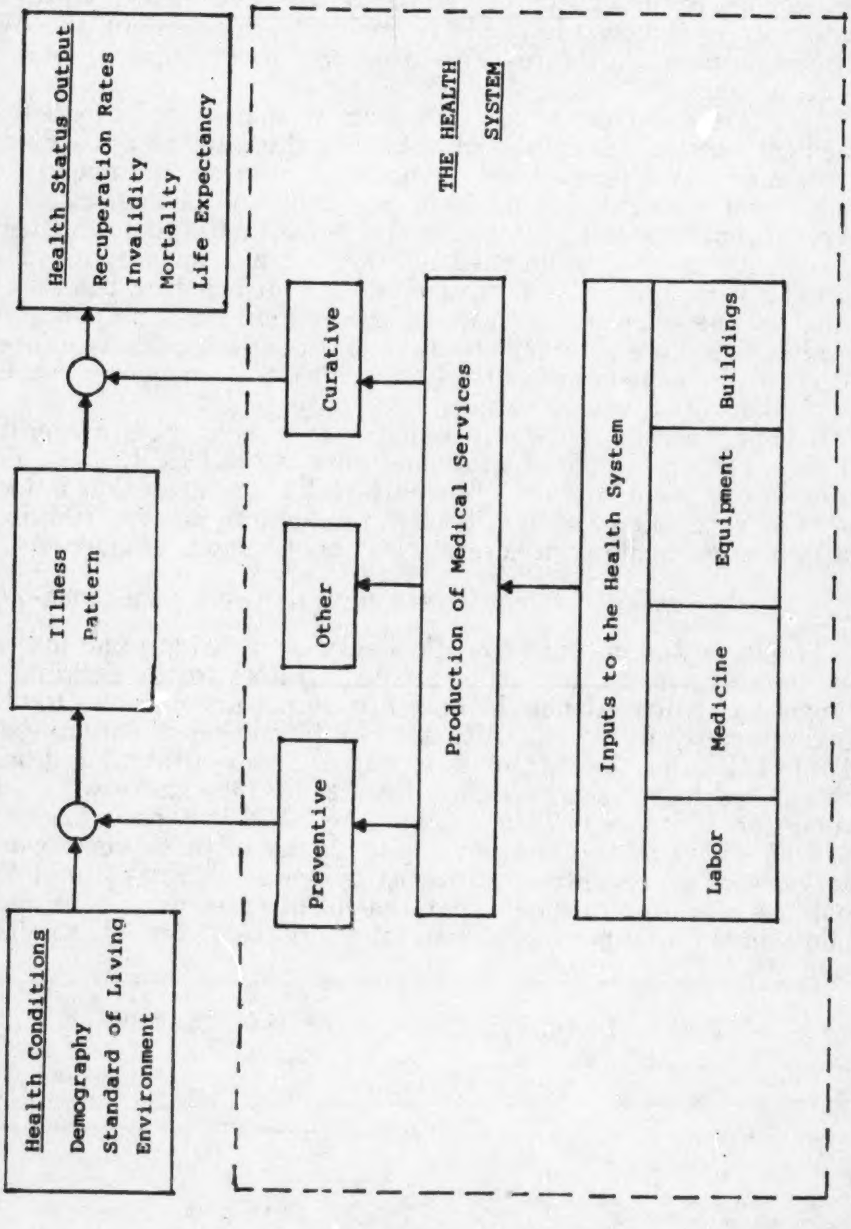
---

[24] The Soviet health production process is described in more detail elsewhere. See Davis, 'The Economics', 1979; Berliner, Schwalberg and Davis, 'The Economics', 1981, and Stone, 'The Relationship', 1981.

[25] In the USSR a considerable amount of illness, especially of the rural population, does not receive medical treatment. See Davis, 'The Economics', 1979, pp. 137-155.

[26] Williams, 'Measuring', 1974

DIAGRAM 2 : The Health Production Process


Health Conditions
Demography
Standard of Living
Environment
Illness Pattern
Health Status Output
Recuperation Rates
Invalidity
Mortality
Life Expectancy
THE HEALTH SYSTEM
Preventive
Other
Curative
Production of Medical Services
Inputs to the Health System
Labor
Medicine
Equipment
Buildings

From Diagram 2 it is evident that the output of the health system can be measured either by health status or medical service indicators. In the first category would be recuperation rates of patients suffering from specific forms of illness, invalidity and mortality rates, and life expectancy statistics. However health status indicators are influenced not only by medical activities but also by the illness pattern. So the health status production function is a complicated one.

A different set of output indicators measures the production of medical services. Examples of these are the number of cardiac surgical operations carried out in hospitals and the number of diagnoses and prescriptions made in polyclinics. An advantage of this type of indicator is that services can be defined and quantified and a relation can be established between output and inputs used. A drawback is that these indicators do not incorporate the measurement of the effect of services on the patient's or the population's health. Since the primary objective of a health system is to prevent or cure illness it is not entirely appropriate to measure output independent of effects on health.

It is beyond the scope of this paper to analyze health conditions, illness patterns or health status outputs in the USSR. These important topics are examined elsewhere.[27] Instead attention is focused on the component of the health production process linking the output of medical services to the inputs of various resources.

B. THE OUTPUT OF MEDICAL SERVICES IN THE U.S.S.R.: 1965–78

Trends in the output of medical services provide some indication of the response to the Soviet medical system to the growing challenges to health. Although there are numerous obstacles to obtaining relevant output statistics some information is summarized in Table 1. Section A contains information about curative and preventive outpatient visits to or by doctors. In 1965 there were 1,563.5 thousand visits, or 6.78 per capita. By 1978 this had increased to 2,569.5 thousand, or 9.84 per capita. Many of these visits were for services of a preventive nature as indicated in rows 3 and 4. The balance were for medical treatment of diseases or validation.[28] In addition the number of visits to feldshers rose from 429 to 432 million.[29]

TABLE 1.—THE OUTPUT OF MEDICAL SERVICES IN THE U.S.S.R, 1965–78

Output indicator	1965	1970	1975	1978	1978 as percent of 1965
A. OUTPATIENT					
1. Patient visits to doctors in polyclinics plus doctor home visits per year (millions)	1,563.5	1,938.9	2,296.5	2,569.5	164

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[27] See Davis, 'The Economics', 1979; Davis and Feshbach, 'Rising', 1980; Berliner, Schwalberg and Davis, 'The Economics', 1981; Cooper and Shatzkin, 'Recent', 1982; and Feshbach, 'Issues' in this volume.

[28] Doctors in the Soviet Union are responsible for validating cases of illness for the social security system. This activity helps to enforce labor discipline and to ensure the fair distribution of welfare payments. But this is neither a preventive nor a curative medical activity.

[29] Feldshers are trained middle medical staff who act as doctor substitutes in rural areas and physicians' assistants in the cities.

TABLE 1.—THE OUTPUT OF MEDICAL SERVICES IN THE U.S.S.R, 1965–78—Continued

Output indicator	1965	1970	1975	1978	1978 as percent of 1965
2. Patient visits to doctors in polyclinics plus doctor home visit per capita per year	6.78	7.98	9.03	9.84	145
3. Outpatient visits for prophylactic purposes (millions)	530	648	684	730	133
4. People examined through periodic screening programs (millions)	82.9	101.3	106.9	109.8	132
5. Outpatient visits to feldshers (millions)	429	428	428	432	101
B. INPATIENT					
6. Hospital bed-days provided (millions)	702.3	828.3	962.9	1,021.1	145
7. Hospital bed-days per capita	3.04	3.41	3.78	3.91	129
8. Admissions to hospitals (millions)	47.3	52.2	57.3	60.6	128
9. Cases of hospitalization per 100 population	20.6	21.5	22.7	23.1	112
C. TOTAL					
10. Total volume of medical assistance to the population (billion equivalent units)	869.5	1,030.6	1,198.9	1,282.9	148

Sources: (1) Korchagin, "Problemy," 1980, pp. 81, 85, 87, 92, 93, 100; (2) Ministerstvo Zdravookhranenie S.S.S.R., "Zdravookhranenie," 1971, p. 25.

Four hospital output indicators are shown in section B. The number of hospital bed-days provided to the population rose from 702.3 million (or 3.04 per capita) in 1965 to 1,021.1 million (3.91 per capita) in 1978. The number of patients admitted to Soviet hospitals increased by 28%, from 47.3 to 60.6 million. The number of cases of hospitalization per 100 population was 20.6 in 1965 and 23.1 in 1978.

These output trends must be interpreted with caution because of three statistical problems. First, the indicators presented do not provide information about the quantities of specific services provided during a doctor visit or hospital bed-day. Second, available indicators do not measure all the outputs of the health system, which has multiple functions.[30] It provides not only preventive and curative services but also engages in validation, scientific research, medical education and administration. Third, little evidence is available about variations in the quality of medical services over time, regions or subsystems. This information is important because a tightening of resource constraints can provoke the standard Soviet response of lowering quality of output in order to achieve quantity targets.

These statistical problems are difficult to resolve because the Soviet Union publishes little about medical output. This in part reflects the Ministry of Health's preoccupation with crude input indicators (such as the number of hospital beds), which provide the basis for health system planning and evaluation. Apparently few data are even collected which would assist decision makers in evaluating medical performance. Strict government censorship of statistics published further hampers objective evaluation of health sector output.

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[30] For a discussion of the multiple functions of a health system see Fuchs, "The Output," 1973.

It would be desirable not only to have information about the different medical services produced in the USSR but also to aggregate them into a single output indicator. However, determination of the value of health output is complicated both by gaps in statistics about quantities of services and by the absence of prices for them. An alternative approach to value aggregation is to devise synthetic total output indicators which would make use of weights derived from time or financial expenditures.

This latter course has been followed by two Soviet health economists. G. A. Popov made a first attempt to estimate total medical output for the period 1950–1968.[31] V. G. Korchagin used a similar methodology to convert medical activities into equivalence units.[32] In his calculation he considered only three basic output indicators: the number of hospital bed-days provided; the number of outpatient doctor visits; and the number of outpatient feldsher visits. The respective weights were : 1,000, 94 and 47, which appear to be derived from the respective 1978 ruble costs of the services: 7.68, 0.73 and 0.36 rubles. Multiplying the output indicators by the weights and summing generates the aggregate equivalence unit output shown in row 10 of Table 1. Since 1965 its value has risen by 48%. Although Korchagin's estimates are not without interest they should be evaluated with caution. Improvements could be made by including all services produced by the health system and by developing a more appropriate set of weights.

This survey of the limited information available about medical service output in the USSR suggests that there has been an increase since 1965. However the deficiencies in the statistics noted above prevent one from drawing simple conclusions about health system response. In order to achieve a balanced assessment input trends and the effects of resource constraints should be evaluated.

C. INPUTS TO THE SOVIET HEALTH SYSTEM: 1965–80

Medical sevices in the Soviet Union are produced using five major categories of inputs: labor, buildings, medical equipment, medicines and non-medical commodities. In this section an assessment is made of trends in the quantity and value of each type of input since 1965. However evaluation of the constraints on inputs and their effect on the quality of medical services and efficiency of production is deferred until Part IV.

1. *Labor*

The health system is one of the most labor intensive branches of the national economy in the USSR. Analysis of labor supply and wage expenditures is therefore of considerable importance. Table 2 presents estimates of civilian health labor supply for the period 1965 to 1980. The first four columns show the number of doctors and middle medical personnel in all health systems except those of the military.[33] In 1965 there were 554.2 thousand doctors in the

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[31] Popov, "Problemy," 1974.

[32] Korchagin, "Problemy," 1980.

[33] It is assumed that the Soviet authorities do not publish statistics about the security services health subsystem as well as that of the Ministry of Defense.

USSR (23.9 per 10,000 population) and 1,691.8 thousand middle medical personnel (72.8 per 10,000). The latter category includes feldshers, midwives, nurses, laboratory technicians and other specialists with post-secondary medical training. In addition there were an estimated 1,069.6 thousand junior medical personnel (ward attendants, porters, etc.) and 764.8 thousand other personnel (administrative staff, construction workers, catering staff etc.) Total employment in the civilian health sector was 4.080.4 thousand.[34] By 1980 the respective numbers were 995.6, 2789.9, 1513.3 and 1055.3 thousands. There was considerable variation in the percentage increases however. The number of doctors went up by 80% but that of junior medical personnel by only 41%. Total health employment rose by 56% over the period to 6,354.1 thousand. The health share of the national labour force also increased from 5.3 to 5.6 percent.

The indicators of Table 2 only provide information about the number of people working in the health service, but a better input measure would be the supply of work hours. This calculation is especially important when making international comparisons because Soviet doctors work fewer hours per day then their counterparts in the West, and the average length of their work day has decreased since 1965. Although estimation of the medical labour input on an hourly basis is beyond the scope of this paper, a preliminary assessment suggests that it has increased less than that of employment.

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[34] This number includes those employed in health activities who are normally in labor supply categories such as education, science, management and construction. As a result, the estimated health labor supply is higher than the figure reported for 'health, physical education and social security' in the national economy statistical yearbook. My estimate for 1976 is also higher than that of Schroeder and Edwards, "Consumption," 1981 which was 4,515.7 thousand.

TABLE 2.—THE SOVIET HEALTH SECTOR LABOR FORCE, 1965–80

	Doctors, all specialties (thousands) (1)	Doctors per 10,000 population (2)	Middle medical personnel (thousands) (3)	Middle medical personnel per 10,000 population (4)	Junior medical personnel (thousands) (5)	Other health sector personnel (thousands) (6)	Total health sector employment (thousands) (7)	Health labor force as share of total (percent) (8)
1965	554.2	23.9	1,691.8	73.0	1,069.6	764.8	4,080.4	5.3
1966	577.7	24.6	1,777.5	75.8	1,103.4	791.5	4,250.1	5.3
1967	598.2	25.3	1,860.7	78.6	1,136.6	813.6	4,409.1	5.4
1968	617.8	25.8	1,943.6	81.2	1,161.5	840.2	4,563.1	5.4
1969	642.0	26.6	2,029.7	84.0	1,200.5	866.7	4,738.9	5.4
1970	668.4	27.4	2,123.0	87.0	1,236.5	895.7	4,923.6	5.5
1971	697.8	28.3	2,195.3	89.1	1,270.0	914.1	5,077.2	5.5
1972	731.8	29.4	2,269.6	91.3	1,302.6	936.7	5,240.7	5.5
1973	766.7	30.6	2,368.8	94.4	1,341.7	966.0	5,443.2	5.6
1974	799.0	31.5	2,423.1	95.7	1,374.3	982.8	5,579.2	5.6
1975	834.1	32.6	2,515.1	98.4	1,409.6	1,000.9	5,759.7	5.6
1976	864.6	33.5	2,585.8	100.3	1,426.6	1,011.6	5,888.6	5.6
1977	897.2	34.5	2,625.9	101.0	1,453.5	1,022.8	5,999.4	5.6
1978	928.7	35.4	2,672.1	101.8	1,476.6	1,040.1	6,117.5	5.6
1979	960.5	36.3	2,719.6	102.8	1,488.8	1,047.0	6,215.9	5.6
1980	995.6	37.4	2,789.9	104.8	1,513.3	1,055.3	6,354.1	5.6
1980 as percent of 1965	180	157	165	144	141	138	156	105

Sources:

Col. 1: TsSU, "Narodnoe," (1980, p. 495), (1972, p. 683), (1967, p. 843), (1969, p. 727), (1974, p. 728), (1973, p. 752).

Col. 2: TsSU, "Narodnoe," (1967, p. 844), (1969, p. 728), (1980, p. 496), (1977, p. 534), (1974, p. 728), (1973, p. 752), (1979, p. 528), (1978, p. 508), (1972, p. 684), (1976, p. 626).

Col. 3: TsSU, "Narodnoe," (1967, p. 846), (1969, p. 730), (1980, p. 497), (1972, p. 686), (1974, p. 730), (1973, p. 754), (1979, p. 529), (1978, p. 509), (1977, p. 535), (1976, p. 627).

Col. 4: TsSU, "Narodnoe," (1967, p. 847), (1969, p. 731), (1980, p. 497), (1977, p. 534), (1974, p. 730), (1973, p. 754), (1979, p. 529), (1978, p. 509), (1972, p. 687), (1976, p. 627).

Col. 5: Korchagin, "Problemy," 1980, gives the ratios of junior medical personnel to doctors for 1960, 1970, and 1978. Through interpolation and extrapolation a ratio series 1965–1980 was obtained. These were then multiplied by the values in col. 1.

Col. 6: The same source and technique as column 5 were used to calculate the other personnel/doctor ratio series. This was then multiplied by col. 1.

Col. 7: The sum of Cols. 1, 3, 5, and 6.

Col. 8: Column 7 divided by total Soviet labor force as reported in TsSU, "Narodnoe," (1967, p. 648), (1969, p. 530), (1980, p. 357), (1974, p. 550).

The labor input can also be measured in monetary terms, by budget expenditures on wages and earnings. There are no published statistics for wage expenditures of the total health system in the USSR. However information is available about republican Ministry of Health budgets, which account for about 80–85 percent of outlays on the health sector labor force. Republican spending on wages (budget article 1) rose from 3,407 million rubles in 1965 to 7,207 million in 1978.[35] It is estimated that in 1980 the sum was 7,916 million rubles.[36]

Since the wage fund grew by 105 percent but the labor force increased by only 56 percent it is evident that average wage payments rose substantially. Available evidence on wage rates confirms this. According to the official statistical yearbook the average monthly wages of those employed in "the health service, physical culture and social security" rose from 79.0 rubles in 1965 to 126.8 rubles in 1980.[37] In Korchagin it is reported that average wages of health personnel are identical to those yearbook figures.[38] From numbers he provides for 1960 and 1978 it is possible to estimate the monthly wage rates shown in Table 3 for 1965 and 1980. If these are converted to yearly wages and multiplied by employment then the estimated wage bill for the civilian health labour force is obtained. This grew from 3,886 thousand rubles in 1965 to 9,566 thousand in 1980, or by 146 percent.[39]

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[35] The 1965 figure is from Ministerstvo Finansov, "Gosudarstvennyy", 1972, pg. 95 and the 1978 one from Korchagin, "Problemy", 1980, pg. 316.

[36] It was estimated that in 1980 the republican share of total health budget spending was 94.5 percent, or 13,864 million rubles. Of this 57.1 percent was devoted to wages, or 7,916 million rubles. See Korchagin, "Problemy", 1980, pg. 253.

[37] Average monthly wages in the national economy rose from 96.5 to 168.9 rubles from 1965 to 1980. This means that the health wage slipped from 82 percent of the national average to 75 percent.

[38] Korchagin, 'Problemy', 1980, pg. 210.

[39] A comparison of the results of this calculation with reported republican budget wage expenditure reveals that in 1965 the latter amounted to 88 percent of the former. This is approximately the share of medical employees in the Ministry of Health system. The estimated 1980 republican figure is 83 percent of that shown in Table 3. The reduced share could be explained by either a relative growth of employment in departmental systems or a rise in wages in non-Ministry of Health subsystems. On the basis of information from Korchagin, "Problemy," 1980 my estimates of 1975–76 wage rates would be higher than those used in Schroeder and Edwards, "Consumption," 1981, pg. 100.

TABLE 3.—WAGES OF SOVIET HEALTH PERSONNEL, 1965 AND 1980

	1965				1980			
	Monthly wage rates (rubles) (1)	Yearly wages (rubles) (2)	Health system employment (thousands) (3)	Health system wage expenditure (million rubles) (4)	Monthly wage rates (rubles) (5)	Yearly wages (rubles) (6)	Health system employment (thousands) (7)	Health system wage expenditure (million rubles) (8)
Category of health employee:								
Doctors	119	1,422	554	788	183.0	2,196	996	2,187
Middle medical	83	995	1,692	1,684	128.0	1,536	2,790	4,285
Junior medical	59	711	1,070	761	93.0	1,116	1,513	1,689
Other	71	853	765	653	111.0	1,332	1,055	1,405
Total	79	948	4,080	[1] 3,886	126.8	1,522	6,354	[2] 9,566

[1] The sum of rows in col. 4 of 3,886 is 0.5 percent greater than the product of 948 x 4,080 due to rounding off errors.

[2] The sum of rows of col. 8 of 9,566 is 1.0 percent less than the product of 1,522 x 6,354 due to rounding off errors.

Sources:
Col. 1: Rows 1–4 were estimated using the 1960 figures from Korchagin, "Problemy," 1980, p. 210 and the published 1965 average health wage from TsSU, "Narodnoe," (1980, p. 365).
Col. 2: Col. 1 x 12.
Col. 3: From table 1.
Col. 4: Col. 2 x col. 3.
Col. 5: Rows 1–4 were estimated using the 1978 figures from Korchagin, "Problemy," 1980, p. 210 and the published 1980 average health wage from TsSU, "Narodnoe," (1980, p. 365).
Col. 6: Col. 5 x 12.
Col. 7: From table 1.
Col. 8: Col. 6 x col. 7.

2. Buildings

As a result of the Stalinist policy of low capital investment in health plus the destruction caused by World War II many Soviet medical buildings were old or had been converted from other uses before 1965. They were usually crowded, dilapidated and unhygienic. A large percentage of hospitals were small and located in rural microdistricts. In 1960 at least 15,920 out of 25,682 hospitals in the Ministry of Health system contained fewer than 50 beds.[40] Most of the increments in hospital beds were achieved by crowding beds into the existing facilities. Bayatova reported that in the Rostov region in 1963 14.8% of new hospital beds were placed in new buildings and 85.2% in old ones.[41]

Changes in the stock of Soviet medical buildings during the period 1965 to 1980 are shown in Table 4. In 1965 there were 26,303 hospitals, with an average size of 85 beds, and 36,696 polyclinics. The value of the health system's capital stock was 9.0 billion rubles, of which buildings accounted for about 80%. Over the next fifteen years capital expenditures from the state budget and economic enterprises significantly exceeded depreciation (columns 5 and 6 show republican budget expenditures on these items). As a result the value of capital stock reached 34.8 billion rubles in 1980.

The number of hospitals and polyclinics actually fell during this period. By 1980 there were 23,107 of the former and 36,123 of the later. This decline reflected a conscious policy decision to close down small unspecialized facilities and replace them with larger modern units. Average hospital size rose from 85 to 144 beds. A high percentage of the new buildings were of standardized design and industrialized construction.

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[40] Ministerstvo Zdravookhranenie, 'Zdravookhranenie', 1971, pp. 8-9.

[41] Bayatova, 'Planirovanie,' 1966, pg. 227.

TABLE 4.—BUILDINGS AND EQUIPMENT IN THE SOVIET HEALTH SYSTEM, 1965–80

	Hospitals (thousands)	Outpatient clinics (thousands)	Hospital beds (thousands)	Value of health capital stock (million constant 1973 rubles)	Republican health budget expenditure—			Ministry of Medical Industry output of equipment (million rubles)	Net imports of medical equipment (thousand foreign trade rubles)
					Capital investment (million rubles)	Capital repairs (million rubles)	Acquisition of equipment (million rubles)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1965	26.3	36.7	2,226	9.0	234.2	164.6	118.1	144.7	35,273
1966	26.4	37.6	2,321	10.1	246.9	183.3	137.7	160.1	31,288
1967	26.4	38.8	2,398	11.1	267.7	193.3	150.7	175.0	32,849
1968	26.4	38.9	2,487	12.2	291.0	212.7	166.0	191.5	36,696
1969	26.4	38.0	2,567	13.4	334.8	240.9	180.1	207.9	39,347
1970	26.2	37.4	2,663	14.6	452.4	258.2	192.9	223.7	48,611
1971	25.8	36.6	2,727	16.1	541.7	273.1	211.1	242.7	56,281
1972	25.4	36.3	2,793	17.9	538.2	262.1	190.7	262.5	62,956
1973	25.1	36.1	2,866	19.7	500.3	275.0	197.3	283.7	54,979
1974	24.6	35.9	2,933	21.7	542.6	299.8	217.6	305.0	61,282
1975	24.3	35.6	3,009	23.9	595.1	332.5	250.1	328.0	77,072
1976	23.9	35.7	3,076	26.1	618.4	381.1	312.9	350.1	91,690
1977	23.7	35.6	3,140	28.5	636.4	408.5	322.9	373.7	105,995
1978	23.4	35.5	3,201	30.7	641.7	437.9	359.5	396.9	119,678
1979	23.2	35.7	3,262	32.7	663.0	464.1	371.3	420.8	138,050
1980	23.1	36.1	3,324	34.8	695.5	486.8	389.5	445.4	112,384
1980 as percent of 1965	88	98	149	387	297	296	330	308	319

Sources:

Col. 1: TsSU, "Narodnoe," (1980, p. 495), (1967, p. 847), (1969, p. 731), (1975, p. 713).

Col. 2: TsSU, "Narodnoe," (1967, p. 843), (1969, p. 727), (1975, p. 713), (1980, p. 495).

Col. 3: TsSU, "Narodnoe," (1967, p. 848), (1969, p. 732), (1980, p. 495), (1975, p. 713).

Col. 4: Korchagin, "Problemy," 1980, states that the health share of total Soviet capital stock (Osnovnye fondy) was 1.3 percent in 1960 and 2.1 percent in 1979. The percentages for the intervening years were interpolated and that of 1980 extrapolated. Values for 1965, 1970, 1972–80 were obtained from TsSU, "Narodnoe," (1973, pp. 57–59), (1974, p. 58), (1979, p. 54), (1980, p. 49). The 1971 value was derived from index numbers in the TsSU, "Narodnoe," (1975, p. 59). The values 1966–69 were interpolated.

Col. 5: This is the sum of republican health budget spending from arts. 13 and 15. The values 1965–70 are from Ministerstvo Finansov SSSR, "Gosudarstvennyy," 1972, p. 95: 1971–75 are from Ministerstvo Finansov SSSR, "Gosudarstvennyy," 1976, p. 92; and 1976–78 from Korchagin; "Problemy," 1980, p. 316. Values of 1979 and 1980 are estimated as 5 percent of the Republican health budget (see col. 3 of table 5).

Col. 6: Same sources as col. 5 for art. 16 spending 1965–78. Values of 1979 and 1980 estimated as 3.5 percent of the Republican health budget (see col. 3 of table 5).

Col. 7: Same sources as col. 5 for art. 12 spending 1965–78. Values of 1979 and 1980 estimated as 2.8 percent of the Republican health budget (see col. 3 of table 5).

Col. 8: From Dergunov, "Puti," 1975, p. 15 the values of medical equipment output per hospital bed for 1960, 1970, and 1975 were obtained. Other ratios were interpolated or extrapolated and multiplied by col. 3.

Col. 9: From Ministerstvo Vneshney Torgovli SSSR, "Vneshnyaya" for years 1966–80 the values for exports and imports of medical equipment and instruments (commodity category 172) were obtained. The difference represents net imports in foreign trade rubles.

3. *Medical equipment*

Medical equipment also makes an important contribution to modern medicine. The most obvious piece of equipment in the Soviet health service is the hospital bed. This indicator is used by the Soviets in planning the hospital system and in the assessment of its performance. Table 4 shows that the number of beds increased from 2,226 thousand in 1965 to 3,324 thousand in 1980, or by 49 percent.

Caution should be observed in interpreting this trend. Hospital bed provision is a valid proxy indicator of the equipment input if a constant relationship between beds and other machines and instruments exists. In the unstable Soviet supply environment this condition probably does not hold.

The bulk of domestic supply of medical equipment comes from 35 enterprises of the Ministry of Medical Industry USSR.[42] Over 4,000 different pieces of equipment are produced, the value of which accounts for 16 percent of the Ministry's annual output. The estimates in column 8 of Table 4 show that output rose from 144.7 million rubles in 1965 to 445.4 million in 1980. Other branches of Soviet industry are responsible for about 17 percent of domestic production of medical equipment. The Soviet Union is also a net importer of equipment and instruments. Table 4 indicates that the value of net imports increased from 35.3 to 112.4 million foreign trade rubles between 1965 and 1980.[43]

About 20 percent of republican health budget articles 13, 15 and 16 (columns 5 and 6 of Table 4) is for the procurement or repair of equipment. It probably accounts for a similar share of capital stock (column 4 of Table 4). Republican spending on non-capital equipment and instruments, which absorbs roughly 3 percent of the budget, rose from 118.1 million rubles in 1965 to an estimated 389.5 million rubles in 1980.

4. *Medicines and medical supplies*

The Soviet health system requires medicines and other medical supplies (such as bandages, vitamins and sutures) in order to produce services. The source of most of these goods is the Ministry of Medical Industry USSR which had 97 enterprises producing 2,382 items in 1975. The value of this output rose from 654.4 to 2,284 million rubles from 1965 to 1980.[44] Net imports of medicines rose from 66.6 to 461.3 million foreign trade rubles over the same period.[45]

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[42] Dergunov, 'Puti', 1975, pg.6.

[43] There is considerable controversy over the meaning of Soviet foreign trade prices, as the recent debate over the share of imports in Soviet net material product indicates (see V. G. Treml and B. L. Kostinsky The Domestic Value of Soviet Foreign Trade, Washington, D.C., U.S. Bureau of the Census, 1982 and the Wharton Centrally Planned Economies Service Current Analyses of July 14, 1982 and August 6, 1982). For this reason the values of net imports of 'medical equipment and instruments' and 'medicines' (see footnote 45) are not comparable to those of domestic production in rubles.

[44] From Dergunov, 'Puti', 1975, pg. 15 one can calculate the output of medicines per capita for years 1960, 1970 and 1975 to be, respectively, 1.38, 4.32 and 6.48 rubles. Through interpolation the 1965 value of 2.85 rubles is obtained. This is multiplied by the population of 229.6 million to determine the value of output. Extrapolation of trends 1970–75 produces a 1980 per capita output of 8.64 rubles. Multiplying this by 264.5 million gives total medicine output of 2,284.0 million rubles.

[45] From Ministerstvo Venesheney Torgovli, 'Vneshnyaya', for years 1966–80 the values of exports and imports of 'medicines' (commodity category 960–962) were obtained. The difference represents net imports in foreign trade rubles.

Inputs of this type are purchased by the health service and the population through the pharmacy system. Republican health budget expenditures on medicines were 438 million rubles in 1965 and an estimated 1,280 million in 1980.[46] For acquisition of 'light inventory' the respective figures were 147 and 348 million rubles.[47]

5. Nonmedical supplies

The health sector has requirements for numerous items of a nonmedical nature. These include fuel for buildings, water, budget and planning forms, food for patients, automobiles, telephones and academic journals. These items are produced by a variety of economic branches. Since input-output tables are not detailed enough to show flows between health and other sectors little can be said about these supplies.

Budget statistics do provide some insight into health system consumption of these residual non-medical inputs. There are three budget expenditure categories of relevance: administrative and housekeeping expenses, acquisition of books, and food. Total republican spending on them was 1,224 million rubles in 1965 and it rose to an estimated 2,735 million rubles by 1980.[48]

This survey reveals that since 1965 Soviet health system expenditures on all five categories of inputs have risen significantly. Available quantity indicators exhibit increases as well. However, these statistics reveal little about the quality of inputs, the adequacy of the aggregate volume of supply, or the balances between demand and supply of specific commodities and types of labor. Also the inputs have increased at varying rates, which suggests a changing production function of medical services. It is unclear whether this is intentional or a byproduct of poor planning and erratic supplies. These and other issues are examined in Part IV before conclusions are reached about the contributions of the various inputs to the production of medical services.

IV. THE IMPACT OF RESOURCE CONSTRAINTS ON THE SOVIET HEALTH SYSTEM

A. HEALTH FINANCE

Knowledge of the precise amount of rubles spent in the Soviet Union on health activities is important for international comparisons or assessments of the role of the health sector in the national economy, but in itself reveals little about health system performance. Of greater significance is the determination of the influence of financial constraints on specific inputs and on microeconomic behavior. Reflecting this, only an abbreviated discussion of sources of health finance and sectoral expenditure is presented.

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[46] The 1965 figure is from Ministerstvc Finansov, 'Gosudarstvennyy', 1982, pg.95 for budget article 10. The 1980 value is estimated as 9.2 percent of the figure shown in column 3 of Table 5.

[47] The source of the 1965 figure is as in footnote 46, but for budget article 14. The 1980 one is 2.5 percent of the republican budget.

[48] This is the sum of republican budget articles 3, 5 and 9. The 1965 figures for 3 and 9 are from Ministerstvo Finansov, 'Gosudarstvennyy', 1972 pg. 95. Expenditure on acquistion of books is estimated to be 32 percent of article 4. The 1980 value is estimated to be 19.7 percent of the total republican health budget.

There are four sources of health finance in the USSR: the state budget, economic ministries, economic enterprises, and the population. Although the state budget is the most important one, the source distribution of health finance varies between the subsystems. The departmental medical facilities are predominantly financed out of the respective ministerial budgets. Economic ministries, such as the Ministry of Railroads, pay for much of their medical services out of profits, whereas non-economic ministries, such as the Ministry of Defense, obtain funding from the state budget. The elite health service probably is financed by the union-level Ministry of Health Budget. Supplements come from education, science and management state budgets. Economic enterprises such as factories and collective farms pay for a variety of medical services and contribute substantial funds for capital investment and repairs of 'industrial' medical facilities. The population pays for some legally provided services, such as abortions, prosthesis, milk for babies and medical examinations. Medical staff living in housing tied to the Ministry of Health make rent and utilities payments.[49] In addition, there are many illegal payments made in the public health sector to obtain access to specific doctors or hospitals, scarce medicine, and attentive treatment.

Accurate determination of expenditures by the total health system for the purchase of inputs is made difficult by the absence of any financial statistics for some subsystems, inadequate definition of the published republican health budget figures and incomplete information about other budget (management, science, etc) spending on health activities. Also the Ministry of Health budget supports some institutions or activities which would not be considered part of the health sector in the West, such as 'sanitoria (non-tuberculosis) for children and teenagers', 'childrens homes' and 'measures for service of invalids of the Patriotic War'.[50] In any international comparison one would want to correct for this.

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[49] Sobelevskii, "Osnovy," 1974, pp. 122–128.
[50] Ibid., pp. 25.

TABLE 5.—FINANCE OF THE SOVIET HEALTH SYSTEM, 1965–1980

	Total state budget "health" expenditures (million rubles) (1)	Union-level health budget expenditures (million rubles) (2)	Republican-level health budget expenditures (million rubles) (3)	Health expenditures as percent of total budget expenditures (4)	Other state budget expenditures on health (million rubles) (5)	Other nonbudget health expenditures (million rubles) (6)	Total Soviet health expenditures (million rubles) (7)	Health expenditure per capita (rubles) (8)	Total health expenditure as percent produced national income (9)
1965	6,623	342	6,281	6.5	1,060	628	8,311	36	4.3
1966	7,047	437	6,610	6.7	1,127	658	8,832	38	4.2
1967	7,384	443	6,941	6.4	1,181	1,176	9,741	41	4.3
1968	8,072	465	7,607	6.3	1,292	1,326	10,690	45	4.4
1969	8,492	490	8,002	6.1	1,359	1,673	11,524	48	4.4
1970	9,208	532	8,676	6.0	1,473	1,675	12,356	51	4.3
1971	9,546	515	9,031	5.8	1,527	2,007	13,080	54	4.3
1972	9,957	538	9,419	5.8	1,593	2,062	13,612	55	4.3
1973	10,420	563	9,857	5.7	1,667	1,855	13,942	56	4.1
1974	10,884	594	10,290	5.5	1,739	1,743	14,366	57	4.1
1975	11,383	623	10,760	5.3	1,778	2,017	15,178	60	4.2
1976	11,758	643	11,115	5.2	1,881	2,219	15,858	62	4.1
1977	12,358	676	11,682	5.1	1,977	2,352	16,687	65	4.1
1978	13,384	732	12,652	5.2	2,141	2,540	18,065	69	4.2
1979	14,027	768	13,259	5.1	2,244	2,616	18,887	72	4.3
1980	14,714	805	13,909	5.0	2,354	2,695	19,763	75	4.3
1980 as percent of 1965	222	235	221	77	222	429	238	208	100

Sources:

Col 1: Statistics for 1965–75 are from Ministerstvo Finansov SSSR, "Gosudarstvennyy," 1972, p. 62 and "Gosudarstvennyy," 1976, p. 60. The values for 1976–80 were estimated to have increased from that of 1975 at rates identical to those of state budget expenditures for health and physical culture reported in TsSU, "Narodnoe" for years 1975–80.

Col 2: Same sources used as col. 1.

Col 3: Col. 1 — col. 2.

Col 4: Col. 1 divided by total state budget expenditures reported in TsSU, "Narodnoe" for years 1965 to 1980.

Col 5: On the basis of analysis in Davis, "The Economics," 1979, p. 236, it is estimated that other state budgets spend an amount on health activities equal to 16 percent of the Ministry of Health budget shown in col. 1.

Col 6: In accordance with Davis, "The Economics," 1979, p. 236.

Col 7: Col. 1 plus col. 5 plus col. 6.

Col 8: Col. 7 divided by the Soviet population as reported in TsSU, "Narodnoe," for years 1965 to 1980.

Col 9: Col. 7 divided by produced national income as reported in TsSU, "Narodnoe," for years 1965 to 1980.

Table 5 presents some basic financial statistics. Ministry of Health budget expenditures rose from 6,623 million rubles in 1965 to an estimated 14,714 million in 1980, or by 122%. Of this spending, about 5.5% was accounted for by the union-level budget and 94.5% by republican budgets. The health share of the total state budget fell from 6.5% to 5.0%, which suggests a lowering of the health sector's relative importance since 1965. Column 5 of Table 5 shows estimates of expenditure on health activities by other budgets such as science, education, management and social security. By 1980 this amounted to 2,354 million rubles. There was also non-budget expenditure on health by economic ministries, industrial enterprises, farms and social organizations such as trade unions. Their contribution increased substantially from 628 million rubles in 1965 (9.5% of the health budget) to 2,695 million in 1980 (18.3% of the health budget). Over the fifteen year period this increase compensated for the decline in the health share of the total budget. Total actual health budget spending was 28.3 billion rubles less than it would have been if the health share had remained at 6.5%, but the sum of non-budget contributions was 29.2 billion rubles. However in the period since 1973 this has not been the case. By 1980 the difference between the actual (14.7 billion rubles) and hypothetical (19.1 billion rubles) health budget was 4.4 billion rubles, whereas non-budget health spending was only 2.7 billion rubles.

Total health spending in the USSR rose by 138% from its 1965 level of 8,311 million rubles to the 1980 figures of 19,763 million rubles. On a per capita basis this was equivalent to an increase from 36 to 75 rubles. Health spending as a share of produced national income, a widely used indicator of questionable merit, remained fairly stable in the range 4.1–4.3%.

B. FINANCIAL CONSTRAINTS ON THE HEALTH SERVICE

In order to determine whether there are financial constraints on the Soviet health system, one needs to examine the financing of the acquisition of various inputs and not just national aggregates such as total health spending. There are three ways to accomplish this. First one can assess whether the prices of inputs have been set at such low levels that they adversely affect decisions about production or supply. Second, financial norms [51] used in budget formulation can be evaluated to detrmine whether they are unrealistically low and undermine the ability of medical establishments to purchase goods and services at prevailing prices. Third, budget statistics for the various items (wages, food, acquisition of medicine) can be examined to establish whether there was a pattern of overfulfillment which indicates spending pressure, or underfulfillment which suggests deficiencies in physical supply. In this section information concerning financial constraints on the supply of labor, buildings and other inputs is analyzed.

There is ample evidence that low average wages and inadequate wage differentials in the health sector have had an adverse effect both on the quality and quantity of labor supplied and on work performance. Since the 1930s average wages of medical workers have been low relative to the national average and especially to those in industry. This low wage policy has enabled the state to increase health employment significantly despite modest budget outlays. For example from 1965 to 1980 the cost of those employed in the health sector rose from 3.9 to 9.7 billion rubles. If health wages had been brought up to the average for the national economy by 1980 then the wage bill would have been 12.9 billion rubles, or 35% more than the actual amount.[52]

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[51] The physical indicators used in health plans (doctor positions, hospital beds, outpatient visits) are linked to the budget through financial norms. For example, a norm might specify how many kopeks should be spent on medicine per patient visit to a doctor in a polyclinic. See Kant, 'Spravochnik', 1979.

Low wages have also had an important effect on the sex composition of labor. Through a combination of pressure to work and the availability of positions many Soviet women work in low priority branches of the economy (health, education, the textile industry, and public catering). In 1980 69% of doctors were women as were 85% of feldshers and 100% of nurses.[53]

The fact that medical wages are low relative to those of specialists of a given educational level in other sectors also influences the quality of applicants to medical schools. To some extent the reasonably high social prestige of doctors counteracts the inadequate financial incentives. However, not many male students with strong science backgrounds compete for entry to medical schools in the USSR. There are a few prestige compensations for middle medical personnel with the result that the standard of nursing and feldsher students is not high.

The growing labor shortages in the USSR are making it more difficult to either attract new middle medical personnel because of the low wages, or to retain those with experience. In the 1971–1975 period 2.3 times more specialists with middle medical qualifications left the health sector for work with higher pay in other branches of the economy than between 1966–70.[54] By the late 1970s about 4,000 were transferring per year. This turnover disrupts not only medical performance but also national manpower planning.

Additional labor problems are caused by inadequate wage differentials. After a worker enters the health sector wage rises are determined by position and longevity. There are few financial rewards for good performance. As a result there is no material incentive for a doctor or nurse to provide better than average medical care, to be productive, or to innovate.[55] Furthermore, lack of sufficient differentials adversely affects the distribution of medical staff. Numerous medical jobs with high work loads or unpleasant work conditions cannot attract personnel in the absence of generous rewards. Many regions or rural districts suffer from chronic deficits of doctors and nurses, but existing supplements to normal wages are inadequate to stimulate compensatory transfers of personnel.

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[52] The actual values for 1965 and 1980 are from Table 3. The hypothetical wage bill is calculated by multiplying the average monthly wage for the national economy in 1980 of 168.9 rubles (see Tsentral'noe, 'Narodnoe', 1980, pg. 364.) by 12 and then by 6,354 thousand (actual employment).

[53] Tsentral'noe, 'Narodnoe', 1980, pg. 497 and Korchagin, 'Problemy', 1980, pg. 166.

[54] Korchagin, 'Problemy', 1980, pg. 178.

[55] Sergievskii, 'Beregite', 1976.

Financial constraints have a negative effect on the construction and repair of medical buildings. Evidence exists that the level of investment has not been adequate to provide enough facilities to cope with current medical activity levels.[56] In 1972 the actual number of outpatient visits in the Soviet polyclinic system was 2.1 times greater than its planned capacity. Expansion of the system to cope with demand while bringing polyclinics up to standard would have required capital investment of over 3 billion rubles in the period 1972–78, however, less than 1 billion was spent.[57]

The financial norms which determine cost estimates for new construction are reported to be low, out-of-date and insufficiently differentiated. In addition, the volume of investment made is insufficient relative to ambitious physical plans for new construction and is spread over too many projects. This familiar problem in the Soviet economy causes long delays in the completion of medical buildings. A further complication is that a considerable portion of health investment is made by economic enterprises out of the sociocultural section of their profit funds. Industrial managers often divert these resources to other, higher priority areas.

The capital repair financial norms are miserly as well. The existing norm of 37.5 kopeks per cubic meter is only a quarter of what is needed to compensate for depreciation (about 1 ruble 60 kopeks).[58] Local medical authorities regularly have to supplement budget article 16 ('capital repair of buildings') in order to compensate. Because of the insufficiency of this norm, there was overspending by 36–44% in this budget category every year in the period 1970–1974 according to Babanovskii.[59] In general Soviet medical buildings deteriorate rapidly and provide an unhygienic and depressing environment for medical treatment.

The acquisition of many other medical and non-medical inputs is hampered by spartan financial norms and inadequate budgets. Norms for expenditure on medicines and dressings are extremely low: around one ruble per bed-day in most hospital departments and 4 kopeks per visit to an outpatient clinic. Despite this, spending on budget article 10 ('acquisition of medicines and dressings') was consistently less than the budget targets every year in the period 1966 through 1974.[60] On the surface this suggests an excess of funds relative to goods. However, according to Babanovskii, in large cities where medicine is available and the disease profile requires more specialized, resource-intensive medical treatment, the budget for medicines is overspent as much as possible. On the other hand, in provincial towns and in the countryside supply deficits prevent the full spending of allocated funds.

According to plan, nutritional standards in Soviet hospitals are low. From 1962 through 1971 only 88 kopeks per hospital bed-day were allocated for the purchase of food for patients. In 1972 this was raised to around one ruble.[61] However, Babanovskii has noted that food prices have risen so that nutritional standards in hospitals have probably not improved.[62]

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[56] If one were to compare actual resource allocation not to what is currently demanded but rather to what would be needed to treat all cases of 'hidden' illness as well, then the magnitude of underinvestment would be even greater.

[57] Korchagin, 'Problemy', 1980, pg. 227.

[58] Babanovskii, 'Voprosy', 1976, pg. 81.

[59] Ibid., pg. 80.

[60] Ibid., pp. 65–68.

With respect to other medical equipment and commodities, the 'tables of supply' which are used in planning to determine the quantities of goods per hospital bed or outpatient doctor position are fifteen to twenty years old as are their corresponding prices. The amounts budgeted are therefore frugal. Korchagin claims that the norms governing material support for new hospital beds are at least 17% too low.[63]

In sum, from input prices, financial norms and budget fulfillment statistics ample evidence can be found of financial constraints on the Soviet health system. The consequences are discussed in the following section.

C. SHORTAGES IN THE HEALTH SYSTEM AND THEIR EFFECTS

The characteristic dynamics of the Soviet Union's shortage economy and the financial constraints identified above lead to widespread shortages in all categories of health system inputs.[64] These shortages cause bottlenecks in the medical service production process, lower sectoral efficiency, and undermine medical diagnosis and treatment.

Labor shortages are pervasive despite the larger number of employees in the Soviet health system and are growing because of the overall tightening labor supply. By Soviet definition, shortages exist at an aggregate level because the number of full-time positions (dolzhnosti) in the health system exceeds the number of available staff. In 1978 95.6% of doctor positions were filled.[65] However numerous doctors work in two positions simultaneously because of shortages and in some rural areas doctor positions remain empty or are filled by feldshers or nurses. As one moves down the occupational hierarchy, from doctor to nurse to ward attendant, the share of filled post diminishes since the low wages and prestige of the latter positions fail to attract the required labor force.

Table 2 revealed the large differences in growth rates between the various categories of labor. Consequently the ratios of middle medical, junior medical and other personnel to doctors have been falling. In 1960 for every doctor the respective numbers of other health workers were 3.2, 2.0 and 1.4; by 1978 they were 2.9, 1.6 and 1.1.[66] Korchagin reports that in the late 1970's there existed a deficit of 600–900 thousand other medical personnel relative to the number of doctors. This is one reason why Soviet doctors spend so much of their time on low level medical and administrative tasks. Various Soviet studies have shown that:

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[61] These norms are differentiated by diet and type of establishment. In 1972 the norms ranged from 91 kopeks for a category I diet in a general hospital to 2 rubles for a category III diet in a tuberculosis hospital. See Sobelevskii, 'Osnovy', 1974, pg. 77 and Kant, 'Spravochnik', 1979, pg. 151. The determination of whether these norms provide Soviet patients with adequate nutrition requires additional research. Expected per capita expenditure on food out of a poverty-line budget in the USSR is about 23 rubles per month (see McAuley, 'Economic', 1979). Even the 88 kopek daily norm amounts to 27 rubles per month, or 17% more before account is taken of economies of scale in food purchases by the health system.

[62] Babanovskii, 'Voprosy', 1975, pg. 72.

[63] Korchagin, 'Problemy', 1980, pg. 257.

[64] See Section II–A of this paper and Kornai, 'Economics', 1980.

[65] Korchagin, 'Problemy', 1980, pg. 154.

[66] Ibid., pg. 173.

> . . . 35-45% of doctors' time is spent on work that does not demand a doctor's competence, such as the filling out of forms, the resolution of economic issues and the fulfillment of auxiliary tasks."[67]

There are widespread shortages of particular categories of specialists. In some cases not enough are trained. For example, despite the rapidly rising share of degenerative diseases in the nation's illness pattern, only one medical institute in the Soviet Union produces specialists in geriatrics. Saksonova observes that in the face of growing demands in the health sector for engineers, biologists, economists and technicians the supply of these non-medical specialists from medical school is being curtailed.[68] In the Ukrainian SSR in 1977 Evseev found that of 26.8 thousand laboratory assistants only 51.3% had special training, and of 11.3 thousand feldshers only 65% had received an appropriate education.[69] In other cases, specialist shortages arise because existing staff avoid boring, unpleasant or overly demanding jobs. The failure to correct this problem by devising appropriate financial incentives results in queues of patients and above- norm workloads for available doctors. Inadequacies in the wage structure contribute to skill deficiencies because doctors and other staff have little motivation to continue their studies in order to improve their qualifications. After graduation the average Soviet doctor gains from experience but gradually loses touch with new developments in medicine.

In the countryside and in the backward regions many positions in medical establishments are chronically unoccupied. Minich reports that in 1965 1,337 out of 9,899 (13.5 percent) rural microdistrict hospitals and 681 out of 3,574 (19 percent) of rural outpatient clinics were without doctors.[70] Existing supplements to normal wages are inadequate to stimulate movement of medical staff to areas of labour shortage, which usually suffer from underdeveloped social and cultural services as well. Consequently many of the doctors in the countryside are recent graduates on compulsory assignment, who attempt to leave as soon as their three years are over.

Past constraints on capital investment have meant that the Soviet Union still does not have enough buildings to support adequately the existing level of medical activity. Attempts to remedy building deficits are hampered both by stingy financial norms and the low priority of the health sector. Construction organizations know that when shortages of labor or materials arise they should cut back on medical facilities before those of a 'productive' nature.

Soviet medical establishments are reported to be short of machinery and equipment of all kinds. These shortages are caused in part by the low budget norms governing machinery and equipment acquisition. A second factor is the inadequate output of the medical industry, which is criticized frequently by Soviet specialists.[71] Available equipment is difficult to maintain properly due to lack of spare parts and engineering staff in health facilities. Medical machines are replaced so slowly that a high percentage become obsolete. For example, according to a survey of regional hospitals in Dnepropetrovsk, Kiev and Kharkov the shares of obsolescent equipment and instruments were respectively 40.3, 39.0 and 45.2 percent in 1975 and 42.0, 40.1 and 47.3 percent in 1978.[72]

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[67] Ibid., pg. 187.

[68] Saksonova, 'Ekonomicheskie', 1976.

[69] Evseev. 'Sotsial'no-Ekonomicheskie', 1979, pg. 136.

[70] Minich, 'Obshestvennye', 1977, pg. 98.

[71] Dergunov, 'Puti', 1975, pp. 41-42.

Not only sophisticated equipment is in short supply. Many of the low technology instruments and commodities which are used daily by medical staff such as stethescopes, thermometers, syringes and bandages are difficult to obtain. Few disposable medical products (such as syringes, paper examination table covers and gowns and glass test tubes) are available either due to shortcomings of Soviet industry:

> . . . The requirements of the health service for many polymer products are satisfied partially or not at all . . . In the USSR only ten disposable medical polymer products are mass produced at present." [73]

The supply of pharmaceutical products is another problem area in the Soviet Union.[74] The effect of the low financial norms governing hospital and polyclinic expenditures has already been mentioned. However, the inadequate production of medicine by the domestic industry and the ineffective distribution of stocks by the network of pharmacies hinder the spending of even the limited resources available. Although net imports of medicines have risen over the past fifteen years it may be assumed that a disproportionate amount of new Western products goes to the closed subsystems, which are protected against the widespread shortages of the public sector.

The Soviet health service, like other branches of the economy, is plagued by erratic supplies of non-medical commodities such as linen, uniforms, furniture, automobiles, tape recorders, food and typewriters. These shortages reflect supply rather than budget constraints. Until the output of Soviet industry improves and the health sector's importance increases the situation will remain constant.

The effects of the various input deficiencies on the production of medical services can be observed in both polyclinics and hospitals. The shortage of polyclinic buildings, most prevalent in the countryside, has an adverse effect on the health system's capacity to provide medical care in a region and imposes substantial time costs on the population. Patients must travel further to obtain treatment, as must doctors or emergency services on home visits. The poor roads in rural areas, inadequate public transport, bad weather and lack of polyclinic automobiles exacerbate these problems. Many polyclinics handle a volume of patients in excess of that for which they are equipped.

The deficits of personnel relative to positions have two direct consequences for primary medical care. If a doctor post is held by a feldsher or nurse, as many are in rural areas, the quality of care is lower than it should be. If all positions in a polyclinic are filled by doctors, with some doubling up, this leads to unusually heavy work loads for the doctors and long waits for the patients. Consequently a doctor has less time to devote to a patient. Overall, the lack of support staff and basic office equipment, in conjunction with the onerous bureaucratic requirements of the Soviet system, produce a situation in which polyclinic doctors must spend a large amount of their time on low-level medical and administrative tasks.

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[72] Evseev, 'Sotsialno-Ekonomicheskie', 1979, pg. 122.

[73] Dergunov, 'Puti', 1975, pg. 44.

[74] Davis, 'An Economic', 1983.

The average Soviet polyclinic is poorly equipped with medical machinery, instruments and medicines, all of which hamper the outpatient doctor in her/his diagnosis and treatment. They tend therefore to refer patients too frequently to hospitals.

The failings of Soviet polyclinics cause problems for hospitals which are difficult to surmount given the available resources. Every year a very large number of Soviet citizens are admitted to hospitals, but many of them have received incorrect diagnoses or should have been treated on an outpatient basis.

The fact that the hospital system has a large number of beds is not as impressive as statistics suggest, because there is ample evidence that excess beds are crowded into wards in violation of space norms. Some are even placed in hospital corridors.[75] However, bottlenecks are not caused by a lack of basic furniture such as beds, but rather by scarcities of skilled labor, equipment, medicines and other supplies.

Patients usually have to wait for several days after admission for diagnosis to commence, and several more for results to be known. Doctors have no personal incentive to speed up the process. Even if they tried to do so, obstacles would be encountered in the overloaded diagnostic departments and laboratories. Other bottlenecks exist in operating theatres or treatment departments as a result of shortages of machinery, anaesthetics, drugs, suture material or staff. Numerous operations are carried out in suboptimal circumstances, with the expected adverse consequences for patients. The virtual absence of disposable equipment and supplies means that the risk of infection in Soviet hospitals is high by Western standards.

Following operations patients remain in hospital for extended periods. This practice may partially reflect staff concern for patients' recuperation and recognition of the crowded living conditions of the average Soviet citizen. However, it also is a consequence of the lack of incentives for patients to leave (they receive adequate social security sickness benefits) and for staff to order discharges. The head doctor knows that the average daily cost of a patient declines rapidly after its peak on the day of an operation. By extending the length of stay it is easier to fulfill the plan for bed-day provision and to reduce the average daily cost per patient. This enables the hospital to cope with its tight budget, which is calculated on the basis of stingy financial norms linked to bed-days.

Available statistics show various forms of inefficiency in the hospital system. The average hospital bed is unoccupied many days of the year as a result of poor planning of admissions and discharges as well as slow capital repair work. In 1975 the average bed was used 320 days in cities and 306 days in the countryside.[76] When these figures are disaggregated to the regional level there is considerable variation, with some hospitals seriously underutilized and others under tremendous pressure. The length of patients' hospitalizations in the USSR are considerably above those in Western countries. From 1970 through 1975 the average stay rose from 14.9 to 15.2 days in cities and from 12.6 to 13.6 days in rural areas.[77] This, combined with slow growth in yearly occupancy, resulted in a decline in the average number of patients treated per bed per year.

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[75] Davis, 'The Economics', 1979, pg. 225.

[76] See Korchagin, 'Problemy', 1980, pg. 239 and Burenkov, 'Sotsialisticheskoe', 1979, pg. 196.

In the Soviet literature many specialists have criticized the inefficiencies and poor quality standards in hospitals. There have been various campaigns to improve hospital performance and patient throughput. However the results to date have not been strikingly positive and are unlikely to become so until there is a reduction in the shortages which afflict the health system and a serious reform of health planning and management.

D. ECONOMIC REFORMS IN THE HEALTH SECTOR

Over the past seventeen years the Ministry of Health and the political leadership in the USSR have had their claims about the superiority of Soviet medicine challenged not only by rising mortality rates but also by numerous critical studies by Soviet medical specialists and patients' complaints. This has generated expressions of concern at the highest political level. President Brezhnev mentioned health problems at both the XXV and XXVI Party Congresses, and the Central Committee of the CPSU has passed several major health-related decrees in the past decade.[78] Although there has not been a fundamental increase in the priority of the health sector or its resource allocation, various reforms of the health system have been implemented in the hope of improving medical performance.

Changes have been made with regards health planning, management and economics.[79] During the past ten years, many of the norms used in physical or financial planning have been raised, or differentiated to take into account the variety of local conditions. Attempts have been made to improve the statistical base and computational capabilities of health planning organizations. Research has expended rapidly in areas such as the 'scientific organization of labor', health service management and health economics.

One interesting development in 1966 was the establishment of a large scale economic experiment in the health sector.[80] The objective of the experiment was to determine whether health managers could spend less than had been budgeted while meeting quantitative plan targets and maintaining quality standards. In other words, to find out whether more could be obtained from less. To provide an incentive for making economies any savings were to be channelled into 'funds of material stimulation' which, as in industry, could be used to give bonuses to workers, improve the sociocultural environment and facilities and to acquire additional supplies. In its initial two-year period seventeen medical facilities, mostly hospitals, were involved.

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[77] Korchagin, 'Problemy', 1980, pg. 239.

[78] The major state documents about health policy for the period 1974–80 produced by the XXV Party Congress, the Central Committee CPSU, the Council of Ministers and the Supreme Soviet are included in 'Zabota', 1980. See especially 'O merakh po dal'neyshemu uluchsheniyu narodnogo zdravookhraneniya' (of 22 September 1977) on pp. 482–494. Other useful references are "Materiali XXVI', 1981 and Burenkov, 'Zadachi, 1982. A recent expression of the state's concern about improving the rural health system can be found in Tsentral'nyy, 'O merakh', 1982. On August 26, 1982 the government issued a major new decree to 'supplement' the health protection measures announced in 1977 (see Tsentral'nyy, 'O dopolnitel'nykh', 1982).

[79] Davis, 'The Economics,' 1979, pp. 201–202.

[80] For a more complete discussion of the economic experiment see Davis, 'The Economics', 1979, pp. 202–211. Other relevant sources include Babanovskii, 'Voprosy', 1976 and Golovteev, 'Itogi,' 1977.

The evaluation of the results from the first phase of the experiment was favorable so it was extended to 1976 and the sample expanded. This final phase was eventually declared a success and the decision was made to introduce this new system of management to the whole health sector. On December 3, 1976 the Council of Ministers USSR published decree No. 984: 'Concerning the rights of leaders of medical establishments, supported by the state budget'. [81] In January 1977 medical facilities in the USSR began their transition to the new management system.

Little information has been published about the success of this reform since its extension from a small sample of specially chosen facilities to the entire health service. It has, no doubt, given head doctors more power to use any excess funds to reward deserving workers on a modest scale and may have resulted in a more rational allocation of resources overall. However, it is probable that the Ministry of Finance has used the new program to force budget cuts on medical establishments. Furthermore, it is unlikely that this reform has been able to correct many of the deficiencies in Soviet health planning or the problems resulting from pervasive shortages.

The most recent expression of high level concern about the health situation is the August 26, 1982 decree of the Central Committee CPSU and the Council of Ministers USSR, entitled 'Supplemental measures to improve the population's health protection'.[82] This decree criticizes many of the health sector deficiencies described above, orders a remedial program, and establishes an interdepartmental council under the Ministry of Health USSR to supervise fulfillment.

The supplemental measures fall into several categories. First, the preventive health authorities are ordered to improve work conditions, the environment, sanitation, health education and recreational opportunities. Second, curative medical services are urged to improve management, staff amenities, emergency care and contact between medical research/teaching institutes and ordinary polyclinics and hospitals. Rude behavior and 'mercenary' practices by medical personnel are to be 'resolutely suppressed'. Third, medical schools are ordered to upgrade their training. Fourth, the scientific research branch is to develop by 1984 a 'comprehensive program for intensified illness prevention and the strengthening of the health of the population', and to devote more effort to the study of cardiovascular and endocrinological diseases, cancer and nervous ailments.

Soviet industry has also been given several tasks. Construction of medical facilities is to be speeded up and the output of pharmaceutical products increased. A higher share of medicine should be 'in forms and packaging convenient for medical use'. The decree orders greater production of medical equipment, especially diagnostic instruments, small devices for mechanizing treatment by doctors, laboratory and ambulance equipment, and machines for medical/genetic screening. The food industry is ordered to produce more dietetic and infant products.

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[81] Kant, 'Spravochnik; 1979, pp. 85–87.
[82] Tsentral'nyy, 'O dopolnitdnykh', 1982.

To ensure success of this ambitious remedial program the Soviet leadership should realign national economic priorities to the advantage of consumption, increase the allocation of resources to the health sector, and further, improve health planning and management. Unfortunately, there is little evidence in the decree that this has happened. Only two new financial measures are announced. The first would allow economic enterprises to give bonuses to rural medical and pharmacy personnel. The second is a wage supplement from 1984 for middle medical personnel working in ambulance and intensive care units. No mention is made of a much needed general pay rise, a new wage differentiation policy, higher financial norms, or an increased commitment to importing deficit goods. If the 1982 decree is not accompanied by augmented health spending and substantive health system reforms then it will be as ineffectual as the 1977 one it is 'supplementing'.

V. CONCLUSIONS

The Soviet health system has always received inadequate resources to enable it to cope with all the tasks confronting it. In order to manage the shortage-related problems it faced, a differentiated approach to medical provision was adopted which ensured that important socio-economic groups obtained preferential treatment in the closed elite, departmental and industrial health subsystems. The residual population has had access to facilities in capital cities, provincial cities, and rural districts. Even in the public system there has been considerable variation in the distribution of medical resources and services between regions.

Resource constraints have had adverse effects in the public system on inputs, efficiency and the quality of outputs. The low wage policy has enabled the Soviet Union to increase the medical labor force substantially at modest expense. But inadequate financial incentives and differentials have undermined the quality of labor input and caused serious labor distribution and productivity problems. Many Soviet medical buildings are old, unsuited to their tasks and unhygienic. The health system has not been well-endowed with modern machinery and equipment and has been plagued by shortages of medicines, instruments, clothing and other non-medical commodities.

The various shortages and absence of appropriate incentives have contributed to inefficiency in resource utilization. Lack of auxiliary personnel has obliged doctors to waste time on menial chores. Poor quality diagnostic work in polyclinics has resulted in lengthy stays in hospitals which in turn has wasted resources.

The economic problems of the Soviet health system have had adverse consequences for its patients. Many people have not had access to specialized medical care and others have been forced into queues in polyclinics and hospitals. The low wages have done little to promote good doctor-patient relations. In any event, the diagnosis and treatment of patients by staff has been hampered by stingy financial norms and deficiencies in the output of the Soviet medical industry.

Over the past two decades a variety of demographic, environmental and consumption factors have generated a more complex illness pattern, one with a growing share of degenerative diseases. This has presented the health system and Soviet society with new challenges.

Available statistics suggest that the output of medical services has increased since 1965, at least in quantitative terms. The inputs used to produce these services have also risen, often from modest levels, and there have been some qualitative improvements.

However there is little evidence that the growing health problems have stimulated a fundamental realignment of Soviet priorities to the benefit of the medical sector. Since 1965 total health expenditures have been growing at about the same rate as produced national income. The shares of medical equipment and medicine imports in total imports have remained stable. Trends in other indicators have been less impressive. The share of health expenditures in the total state budget has fallen from 6.5 to 5.0%. Since 1973 the increase in expenditure from other sources has been insufficient to compensate for this decline. Medical wages relative to the national average have dropped from 82% to 75%. Many of the long-standing problems of health planning, budgeting and management have not been corrected.

As a result, resource constraints have remained tight and the output of medical services has been insufficient in quantity and quality to satisfy the needs of the population. One manifestation of this has been the rise in age-specific death rates in the USSR. Although the health system per se did not cause the mortality rise, it is partially responsible because it has proved unable to prevent or cure the illnesses which result in death.

This failure of the health system is not only a social tragedy, but has also resulted in significant economic losses because of occupational illness, invalidity and premature death.

The policies required to improve the health situation are obvious enough. Efforts should be made to enhance diets, housing and passenger transportation. Effective preventive programs are needed to combat alcoholism, environmental pollution and influenza epidemics. Within the medical sector there should be substantial increases in average wages to attract good personnel and greater wage differentiation to stimulate improved performance. Most financial norms should be raised to more generous levels, as should budgets of medical establishments. However increased availability of health finance must be accompanied by substantial growth in the supply of medical and non-medical commodities. In order to generate these supplies the state must invest more in the domestic medical industry and import whatever is necessary to compensate for short-term deficits.

The August 1982 party/government decree, 'Supplemental measures to improve the population's health protection', indicates that the leadership is aware of health and medical problems. But there is little evidence to date of a realignment of national priorities to the benefit of the health sector or a willingness to explore and eliminate the deep-seated causes of the poor health situation. Perhaps the new Andropov regime will be more welfare-oriented than its predecessor. If not, the adverse consequences of inaction will be experienced most by those lower down the Soviet socio-economic hierarchy.

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DEMOGRAPHIC TRENDS IN THE SOVIET UNION: 1950-2000

By Stephen Rapawy[*] and Godfrey Baldwin[**]

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I. INTRODUCTION

This paper gives a brief discussion of the major demographic trends experienced by the Soviet population during the post-war period and a summary presentation of new population projections to the year 2000. The first part of the paper provides basic statistics and descriptions of trends in fertility, mortality, internal migration, urbanization, changes in the age-sex composition of the population, and changes in the distribution of the population by language group, nationality, and major religion. The second part of the paper gives data from new projections prepared in May 1982 by the U.S. Bureau of the Census. Projected figures are given for total population, births, deaths, the associated vital rates, population by 5-year age groups and sex, and the population by selected age groups. The final section of the paper provides information on the sources, methods, and assumptions used in preparing the projections.

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II. PAST DEMOGRAPHIC TRENDS, 1950-80

A. POPULATION CHANGE

During the 30-year period, the Soviet population grew at an average annual rate of 1.3 percent and the increase amounted to almost 86 million (table 1). The increase was not uniform during the three decades, but reached the maximum average annual growth rate of 1.7 percent in the 1950's which added 33.8 million people to the Soviet population. In the following decade, the growth of the population started slowing down and the lowest increase was registered in the 1970's. The population increased during this last decade at an annual rate of 0.9 percent and grew in absolute terms by 22.8 million. The decreasing growth was caused largely by the declining birth rate as changes in the death rate had a minimal affect on the population change.

TABLE 1.—TOTAL POPULATION AND AVERAGE ANNUAL CHANGE, FOR THE U.S.S.R. AND REPUBLICS: 1950 TO 1980

[Population in thousands as of January 1; figures may not add to totals due to rounding]

Republic	1950	1960	1970	1980	Average annual percent change				Percent distribution			
					1950–60	1960–70	1970–80	1950–80	1950	1960	1970	1980
U.S.S.R.	178,547	212,372	241,640	264,486	1.7	1.3	0.9	1.3	100.0	100.0	100.0	100.0
Baltic Republics	5,614	6,078	6,846	7,423	.8	1.2	.8	.9	3.1	2.9	2.8	2.8
Lithuania	2,573	2,756	3,127	3,420	.7	1.3	.9	.9	1.4	1.3	1.3	1.3
Latvia	1,944	2,113	2,363	2,529	.8	1.1	.7	.9	1.1	1.0	1.0	1.0
Estonia	1,097	1,209	1,356	1,474	1.0	1.1	.8	1.0	.6	.6	.6	.6
Slavic Republics	145,735	169,662	186,145	197,929	1.5	.9	.6	1.0	81.6	79.9	77.0	74.8
R.S.F.S.R.	101,438	119,046	130,036	138,365	1.6	.9	.6	1.0	56.8	56.1	53.4	52.3
Ukraine	36,588	42,469	47,111	49,953	1.5	1.0	.6	1.0	20.5	20.0	19.5	18.9
Belorussia	7,709	8,147	8,999	9,611	.6	1.0	.7	.7	4.3	3.8	3.7	3.6
Moldavia	2,290	2,968	3,568	3,968	2.6	1.8	1.1	1.8	1.3	1.4	1.5	1.5
Transcaucasian Republics	7,700	9,774	12,291	14,227	2.4	2.3	1.5	2.0	4.3	4.6	5.1	5.4
Georgia	3,494	4,129	4,685	5,041	1.7	1.3	.7	1.2	2.0	1.9	1.9	1.9
Azerbaydzhan	2,859	3,816	5,115	6,112	2.9	2.9	1.8	2.5	1.6	1.8	2.1	2.3
Armenia	1,347	1,829	2,491	3,074	3.1	3.1	2.1	2.8	.8	.9	1.0	1.2
Kazakhstan	6,592	9,755	13,004	14,858	3.9	2.9	1.3	2.7	3.7	4.6	5.4	5.6
Central Asian Republics	10,616	14,135	19,785	26,081	2.9	3.4	2.8	3.0	5.9	6.7	8.2	9.9
Uzbekistan	6,194	8,395	11,796	15,765	3.0	3.4	2.9	3.1	3.5	4.0	4.9	6.0
Kirgiziya	1,716	2,131	2,932	3,588	2.2	3.2	2.0	2.5	1.0	1.0	1.2	1.4
Tadzhikistan	1,509	2,045	2,899	3,901	3.0	3.5	3.0	3.2	.8	1.0	1.2	1.5
Turkmenia	1,197	1,564	2,158	2,827	2.7	3.2	2.7	2.9	.7	.7	.9	1.1

Sources: Data for 1950 through 1970 from U.S. Bureau of the Census. "Population Projections by Age and Sex: for the Republics and Major Economic Regions of the U.S.S.R. 1970 to 2000," Series P-91, No. 26, Washington, D.C. 1979, p. 3; and for 1980 from TsSu, "Narodnoye khozyaystvo SSSR v 1979 g.; statisticheskiy yezhegodnik," Moscow, Statistika, 1980, p. 10.

Population growth varied among the republics. There is a natural division between the Baltic and Slavic republics which had lower growth rates compared to the "southern tier" republics with substantially higher rates of growth.[1] Moldavia had a population growth closer to the southern tier republics than to the Baltic and Slavic republics. Over the 30-year period, the Baltic republics had the lowest growth rate which amounted to an annual rate of 0.9 percent; in absolute numbers the population increased by 1.8 million. The growth in the Slavic republics was only slightly higher, 1 percent annually, but since these republics comprise the bulk of the Soviet population, the increase in absolute numbers amounted to over 52 million. The growth rates for the southern tier republics were approximately two to three times higher than those for the Slavic republics. The total population increase in the southern tier was over 30 million. The differential growth rates resulted in a noticeable shift in the relative distribution of the population from Slavic to southern tier republics. The Slavic republics comprised 81.6 percent of the total population in 1950 but only 74.8 percent in 1980; in contrast, the share of the southern tier republics increased from 13.9 percent to 20.9 percent during the same period.

B. INTERNAL MIGRATION

The population shifts described above were also affected, to a limited extent, by internal migration during the three decades.[2] In the 1950's, the largest net outmigration, over 900,000, occurred in Belorussia. The huge outmigration reduced the growth of the republic's population to less than half a million and the annual growth rate amounted to only 0.6 percent, the lowest of any republic. The R.S.F.S.R. had the second largest net outmigration of nearly 900,000. A much smaller net outmigration occurred in Lithuania, Kirgiziya, and Turkmenia. The largest net inmigration of about 950,000 was estimated for Kazakhstan. The migration was especially heavy during the second half of the decade and was linked to the Virgin Lands Program initiated at that time. The Ukraine experienced the second largest net inmigration after Kazakhstan (nearly 600,000). Most migrants appeared to have settled in the industrialized eastern and southern portions of the republic. During the decade, Uzbekistan also had large net inmigration of approximately a quarter million. The large migration to Uzbekistan cannot be associated with specific large economic projects as was the case in Kazakhstan. It seems to be related to the frequently mentioned reluctance on the part of Uzbeks to migrate from rural to urban areas.[3] The available non-agricultural jobs were staffed by individuals who migrated from outside the republic. The remaining republics had a modest net inmigration.

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[1] The southern tier republics include the Transcaucasian republics, Kazakhstan, and the Central Asian republics.

[2] The net migration by republic has been estimated from the Soviet published figures on population, births and deaths. The annual net migration is estimated by deriving net change in the population for two adjacent years and subtracting natural increase of the population for the corresponding year. The figures should be viewed as an approximation of the internal migration since they reflect any discrepancies which may be found in the official Soviet statistics. The estimated migration patterns are supported by the Soviet literature. See N. Rogovskiy, "Some Population and Labor Problems," Planovoye khozyaystvo, no. 3, March 1975, p. 107.

[3] A. I. Ginzberg, "On the Influence of Some National Traditions on Migration from Village to City (Based on the Material from Moldavian and Uzbek SSSRs)," Sovetskaya etnografiya, no. 4, July and August 1980 and Murray Feshbach, "Prospects for Outmigration from Central Asia

In the 1960's, net outmigration intensified for the R.S.F.S.R. and amounted to approximately 1.2 million. Belorussia continued to experience outmigration but at a sharply reduced rate. The net ourflow amounted to approximately 200,000 or less than one quarter compared to the previous decade. Georgia and Azerbaydzhan also had a net outmigration which was modest in comparison to the two other republics. Kazakhstan continued to experience large net inmigration amounting to about 600,000 which represented a reduction of more than a third compared with the previous decade. The Ukraine had a net inmigration but the figure was somewhat lower than for the 1950's. The net inmigration to Uzbekistan nearly doubled over the earlier decade. The three Baltic republics, Moldavia, and the remaining Central Asian republics had a positive migration balance.

During the 1970's, internal migration slowed down in comparison with the previous two decades and some reversals occurred in the migration pattern. Kazakhstan which traditionally had a positive migration balance, registered net outmigration of over half a million. Outmigration increased in Georgia and Azerbaydzhan over the previous decade. Kirgiziya, Turkmenia, Moldavia, and Belorussia also showed a small net outmigration. During the three decades the net outmigration from Belorussia was reduced from over 900,000 in the 1950's to under 100,000 in the 1970's. Migration for the R.S.F.S.R. shifted from a long-term trend of net outmigration during the mid-1970's. The net inmigration for the entire decade was over 400,000. The Ukraine and Uzbekistan continued to have a net inmigration but at a considerably lower level than in the previous years. All the remaining republics had some inmigration.

C. AGE COMPOSITION

Table 2 shows the percent distribution by broad age groups for the Soviet Union and republics for 1959, 1970, and 1980. The data for the country as a whole indicates the aging of the population for the 21-year period as does the increase in the median age between 1950 and 1980 from 24 to 29 years. The youngest age group, 0–15 years of age, decreased from 30.4 percent of the total population in 1959 to 26.0 percent in 1980. During the same period, population in the working age groups (males aged 16 to 59 and females aged 16 to 54 years) showed definite signs of aging. The proportion of the total population in the younger age group, 16–39 years, decreased by 3.6 percentage points while that in the older age group, 40–59/54 years, increased by 4.7 percentage points. At the same time, the pension age population (females aged 55 and over and males aged 60 and over) increased from 12.2 percent to 15.5 percent of the total.

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and Kazakhstan in the Next Decade," in Congress of the United States, Joint Economic Committee, Soviet Economy in a Time of Change, 96th Congress, 1st Session, Washington, D.C., 1979, p. 670.

TABLE 2.—PERCENT OF TOTAL POPULATION IN BROAD AGE GROUPS, FOR THE U.S.S.R. AND REPUBLICS: 1959, 1970, AND 1980

Republic	Ages 0–15			Ages 16–39			Ages 40–59/54 [1]			Ages 60/55 and over [2]		
	1959 [3]	1970 [3]	1980 [4]	1959 [3]	1970 [3]	1980 [4]	1959 [3]	1970 [3]	1980 [4]	1959 [3]	1970 [3]	1980 [4]
U.S.S.R.	30.4	30.9	26.0	40.1	35.6	36.5	17.3	18.5	22.0	12.2	15.0	15.5
Baltic Republics	25.8	25.7	23.4	38.1	35.9	34.5	19.2	19.2	23.2	16.8	19.2	18.9
Lithuania	28.6	28.6	25.0	38.7	35.5	35.6	17.9	18.2	22.3	14.8	17.7	17.1
Latvia	23.4	23.0	21.6	37.8	36.1	33.6	20.4	20.2	24.1	18.4	20.7	20.7
Estonia	23.9	23.5	22.7	37.4	36.2	33.6	20.1	20.1	23.7	18.6	20.2	20.0
Slavic Republics	29.2	28.2	22.9	40.6	36.2	36.6	17.9	19.6	23.5	12.3	16.0	17.0
R.S.F.S.R.	30.0	28.5	22.8	40.7	36.7	37.2	17.7	19.5	23.5	11.8	15.3	16.5
Ukraine	27.1	26.6	22.8	40.4	35.3	34.8	19.0	20.4	23.7	13.5	17.7	18.7
Belorussia	31.3	30.9	24.5	39.3	34.9	36.5	15.9	18.1	22.7	13.5	16.2	16.3
Moldavia	34.7	34.3	28.7	39.3	35.1	37.8	16.0	18.2	19.8	10.0	12.4	13.6
Transcaucasian Republics	34.6	40.0	32.9	40.0	33.6	37.1	13.6	14.6	19.2	11.8	11.8	10.9
Georgia	30.2	32.5	27.4	40.8	34.9	35.8	15.3	17.8	22.2	13.7	14.7	14.6
Azerbaydzhan	38.0	46.2	37.7	39.1	31.7	37.1	12.4	12.2	16.7	10.5	9.9	8.6
Armenia	37.8	41.5	32.5	40.1	34.9	39.3	12.1	13.6	19.0	10.0	10.1	9.2
Kazakhstan	36.4	39.7	33.4	39.4	35.4	38.3	14.1	14.5	18.1	10.1	10.4	10.2
Central Asian Republics	38.9	46.9	43.4	36.6	30.5	34.5	13.0	12.4	13.8	11.5	10.2	8.3
Uzbekistan	38.9	47.2	43.6	36.1	30.3	34.4	13.0	12.0	13.6	12.0	10.5	8.3
Kirgiziya	37.9	43.9	39.8	37.0	31.3	35.2	12.8	13.9	15.6	12.2	10.9	9.3
Tadzhikistan	39.9	48.7	45.6	37.6	30.2	33.6	12.5	12.0	13.4	10.0	9.1	7.4
Turkmenia	39.2	46.9	43.6	37.1	31.3	34.9	13.6	12.6	13.6	10.1	9.1	8.0

[1] Males 40–59 years of age and females 40–54 years of age.
[2] Males 60 years of age and older and females 55 years of age and older.
[3] January 15.
[4] January 1.

Sources: Data for 1959 and 1970 from TsSU, Itogi Vsesoyuznoy perepisi naseleniye 1970 goda, vol. II, Moscow, Statistika, 1972, table 3. Data for 1980 estimated by the U.S. Bureau of the Census in May 1982 for the U.S.S.R. and in March 1977 for the republics.

Population trends described for the U.S.S.R. are broadly comparable to those in the Baltic and Slavic republics, however, the Baltic republics have an older population. The greatest difference between the two groups of republics is evident in the population 0-15 years of age and the pension age group. The Baltic republics have a smaller share of the population in the youngest age group and a greater share in the pension age group than do the Slavic republics.

Moldavia, the Transcaucasian republics, and Kazakhstan, on balance, have a younger population than the Baltic and Slavic republics but with some exceptions follow similar trends. In respect to the population 0–15 years of age, these republics showed a relative increase between 1959 and 1970, with the exception of Moldavia, which registered a slight decrease. However, during the next decade, all republics registered a substantial decrease. The republics have a smaller share of pension age population compared with the Baltic and Slavic republics. In Azerbaydzhan, the pension age population has been declining steadily as a share of total population.

The share of the population 0–15 years of age was greater in 1980 than in 1959 for all four Central Asian republics, a trend contrary to that in the other republics. Moreover, the contrast between the Baltic and Slavic republics on the one hand and the Central Asian republics on the other is quite noticeable. In the former republics, the youngest age group accounted for 22 to 25 percent of the total population in 1980 compared to 40 to 46 percent in the Central Asian republics. For the latter republics the proportions for the 0–15 age group increased significantly between 1959 and 1970 and then declined during the next intercensal period. This trend reflects the growth pattern over time reported for the Muslim population in the census data, as the Central Asian republics are populated mostly by Muslims. The average annual rate of growth between 1959 and 1970 for the Muslims amounted to 3.3 percent but decreased to 2.5 percent between 1970 and 1979.[4] These republics also have a decreasing share in the pension ages compared to increasing shares in this age group for most of the other republics. The proportion of the Soviet working age population in the Slavic republics declined from 82.7 percent to 77.7 percent during the 21-year period while the share in the southern tier republics increased from 14 percent to 19 percent.[5] The shift has an impact on the labor supply since the population in the southern tier republics show little propensity to migrate or participate in non-agricultural employment.[6]

D. SEX COMPOSITION

Data for the Soviet population by sex are given in table 3. Because of wars and other internal disorders which had taken place during earlier periods in Soviet history, the normal male-female ratio has been distorted. Soviets claim that during the Second World War their losses amounted to 20 million,[7] with males of military ages sustaining disproportionate losses. The 1959 census showed a great disparity between the number of men and women 35 to 49 years of age. These cohorts would have been 21–35 years of age in 1945 and, therefore, most directly involved in the war. Men in this age group amounted to 13.2 million compared to 21.0 million women, or only 63 males per 100 females. When we look at the sex composition of the 35 to 49 age group in 1980, there were only 1.8 million more women than men, or 93 males per 100 females. Stable growth over the last several decades has produced a more normal sex ratio. The overall excess of females has been reduced from 20.7 million to 17.7 million between 1959 and 1980 and the number of males per 100 females increased from 82 to 87. Over the years, disparities in the sex ratio among republics decreased, but substantial differences remain. The Baltic and Slavic republics still have considerably lower sex ratios than the southern tier republics. Based on the available data, it is not possible to completely explain these differences, but uneven war losses, differential male mortality among republics, and migration probably are contributing factors.

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[4] Stephen Rapawy, "Census Data on Nationality Composition and Language Characteristics of the Soviet Population: 1959, 1970, and 1979," unpublished tables, U.S. Bureau of the Census, January 1982, table 7.

[5] Derived from data listed in the sources to table 2.

[6] T. V. Ryabushkin, Regional'nyye osobennosti vosproizvodstva i migratsii naseleniya v SSSR, Moscow, Nauka, 1981, p. 6.

TABLE 3.—POPULATION OF THE U.S.S.R. AND REPUBLICS, BY SEX: 1959, 1970, AND 1980

[Population in thousands, figures may not add to totals due to rounding]

Republic	1959 [1]		1970 [1]		1980 [2]		Males per 100 females		
	Males	Females	Males	Females	Males	Females	1959	1970	1980
U.S.S.R.	94,050	114,776	111,399	130,321	123,397	141,089	82	85	87
Baltic Republics	2,689	3,313	3,169	3,680	3,458	3,965	81	86	87
Lithuania	1,245	1,467	1,468	1,660	1,611	1,809	85	88	89
Latvia	919	1,174	1,081	1,284	1,165	1,364	78	84	85
Estonia	525	672	620	736	682	792	78	84	86
Slavic Republics	74,582	92,877	84,768	101,440	91,247	106,682	80	84	86
R.S.F.S.R.	52,425	64,109	59,325	70,754	63,916	74,449	81	84	86
Ukraine	18,575	23,294	21,305	25,821	22,861	27,092	80	83	84
Belorussia	3,581	4,474	4,138	4,865	4,470	5,141	80	85	87
Moldavia	1,334	1,551	1,662	1,907	1,870	2,098	86	87	89
Transcaucasian Republics	4,464	5,040	5,903	6,393	6,845	7,382	89	92	93
Georgia	1,865	2,179	2,203	2,484	2,369	2,672	86	89	89
Azerbaydzhan	1,757	1,941	2,483	2,634	2,979	3,133	90	94	95
Armenia	842	921	1,217	1,275	1,497	1,577	92	95	95
Kazakhstan	4,415	4,880	6,263	6,746	7,170	7,688	90	93	93
Central Asian Republics	6,567	7,115	9,635	8,156	12,807	13,274	92	95	96
Uzbekistan	3,897	4,222	5,744	6,055	7,744	8,021	92	95	97
Kirgiziya	975	1,091	1,402	1,531	1,744	1,844	89	92	95
Tadzhikistan	965	1,016	1,426	1,473	1,927	1,974	95	97	98
Turkmenia	730	786	1,063	1,096	1,392	1,435	93	97	97

[1] January 15.
[2] January 1.

Sources: Data for 1959 and 1970 from TsSU, Itogi Vsesoyuznoy perepisi naseleniye 1970 goda, vol. II, Moscow, Statistika, 1972, table 1; and for 1980 from Vestnik statistiki, no. 11, November 1980, p. 74.

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[7] B. Ts. Urlanis, Narodo-naseleniye stran mira; spravochnik, Moscow, Statistika, 1978, p. 11.

E. URBAN GROWTH

The Soviet Union has experienced rapid urbanization throughout its history. Between 1927 and 1976, the urban population increased by 129 million persons and the proportion of the population living in urban areas increased from less than 20 percent to over 60 percent. Of that number, about 73 million is due to migration from rural areas, 37 million resulted from natural growth, and 19 million accrued as a result of expanding urban boundaries.[8] Heavy migration from rural to urban areas has continued to the present. During the period 1971–1975, the urban population increased by 17.6 million with 9.7 million or 55.1 percent coming from the villages.

Table 4 shows urban and rural populations by republic for the three post-war decades. During the three decades, the urban population increased by almost 97 million while the rural population decreased by 11 million. At the beginning of 1980, 63 percent of the Soviet population lived in urban areas compared to 39 percent in 1950. All republics experienced considerable urbanization, but the Slavic and Baltic republics are the most urbanized. In the more urbanized republics there has been extensive migration from villages to towns within each republic as well as migration to other parts of the country. Migration reduced the size of the rural population in the Baltic and Slavic republics. This did not occur in the southern tier republics, where the large natural increase in the rural population was only partially offset by outmigration.

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[8] Ryabushkin, op. cit., p. 48.

TABLE 4.—URBAN AND RURAL POPULATION OF THE U.S.S.R. AND REPUBLICS: 1950 TO 1980

[Population in thousands as of January 1]

Republic	1950			1960			1970[1]			1980			Percent change, 1950–1980	
	Urban	Rural	Percent urban	Urban	Rural	Percent urban	Urban	Rural	Percent urban	Urban	Rural	Percent urban	Urban	Rural
U.S.S.R.	69,414	109,133	38.9	103,618	108,754	48.8	135,991	105,729	56.3	166,210	98,276	62.8	139.4	−9.9
Baltic Republics	2,126	3,488	37.9	2,965	3,113	48.8	3,929	2,919	57.4	4,884	2,539	65.8	129.7	27.2
Lithuania	729	1,844	28.3	1,083	1,673	39.3	1,571	1,557	50.2	2,106	1,314	61.6	188.9	28.7
Latvia	881	1,063	45.3	1,191	922	56.4	1,477	887	62.5	1,745	784	69.0	98.1	26.2
Estonia	516	581	47.0	691	518	57.2	881	475	65.0	1,033	441	70.1	100.2	24.1
Slavic Republics	58,145	87,590	40.9	86,196	83,466	50.8	110,577	75,630	59.4	133,166	64,763	67.3	129.0	26.1
R.S.F.S.R.	43,749	57,689	43.1	63,740	55,306	53.5	80,981	49,098	62.3	96,796	41,569	70.0	121.3	27.9
Ukraine	12,777	23,811	34.9	19,851	22,618	46.7	25,688	21,438	54.5	30,972	18,981	62.0	142.4	20.3
Belorussia	1,619	6,090	21.0	2,605	5,542	32.0	3,908	5,094	43.4	5,398	4,213	56.2	233.4	30.8
Moldavia	388	1,902	16.9	670	2,298	22.6	1,130	2,439	31.7	1,586	2,382	40.0	308.8	25.2
Transcaucasian Republics	3,059	4,641	39.7	4,501	5,273	46.0	6,286	6,009	51.1	7,912	6,315	55.6	158.6	36.1
Georgia	1,241	2,253	35.5	1,744	2,385	42.2	2,240	2,446	47.8	2,629	2,412	52.2	111.8	7.1
Azerbaydzhan	1,252	1,607	44.8	1,835	1,981	48.1	2,564	2,553	50.1	3,254	2,858	53.2	159.9	77.8
Armenia	566	781	42.0	922	907	50.4	1,482	1,010	59.5	2,029	1,045	66.0	258.5	33.8
Kazakhstan	2,463	4,059	37.8	4,286	5,324	44.6	6,498	6,351	50.6	8,070	6,788	54.3	227.6	67.2
Central Asian Republics	3,233	7,453	30.3	5,000	9,280	35.0	7,571	12,381	37.9	10,592	15,489	40.6	227.6	107.8
Uzbekistan	1,934	4,330	30.9	2,872	5,668	33.6	4,362	7,598	36.5	6,500	9,265	41.2	236.1	114.0
Kirgiziya	475	1,241	27.7	722	1,409	33.9	1,098	1,835	37.4	1,389	2,199	38.7	192.4	77.2
Tadzhikistan	391	1,118	25.9	682	1,363	33.3	1,077	1,823	37.1	1,349	2,552	34.6	245.0	128.3
Turkmenia	433	764	36.2	724	840	46.3	1,034	1,125	47.9	1,354	1,473	47.9	212.7	92.8

[1] Census data, January 15.

Sources: Data for 1950 from Vestnik statistiki, no. 4, April 1964, pp. 86 and 88; for 1960 and 1970 from Vestnik statistiki, no. 2, February 1971, pp. 85–86; and for 1980 from TsSU, Narodnoye khozyaystvo SSSR v 1979 g.; statisticheskiy yezhegodnik, Moscow, Statistika, 1980.

In 1950 the urban population in the Slavic republics amounted to 41 percent compared to 40 percent for the Transcaucasian republics and 30 percent in the Central Asian republics. However, by 1980 the gap had widened as 67 percent of the population in the Slavic republics lived in urban areas compared to 56 percent for Transcaucasia and 41 percent for Central Asia. In absolute numbers the urban population increased substantially in all republics. Urban population in Central Asia, for example, increased from 3.2 million in 1950 to 10.6 million in 1980. At the beginning of 1980, there were 20 cities in the Soviet Union with a population of over one million and three of these cities were located in the southern tier republics.[9]

F. FERTILITY

Births in the U.S.S.R. in 1980 numbered 4,851,000, which was only slightly higher than the 1950 total of 4,805,000. However, during the intervening years, there had been a substantial variation in number, ranging from a high of 5,341,000 births in 1960 to a low of 4,087,000 births in 1969.[10] The 1950's was the most fertile decade with 50.3 million births occurring compared to 45.5 million during both the 1960's and the 1970's. The large number of births in the 1950's was due in part to the increase of females in the high-fertility ages of 20 to 34 years. The number of women in this age group increased between 1950 and 1960 from 24.8 million to 30.2 million.[11] In the 1960's the number of women in the high-fertility ages decreased and in 1970 amounted to only 26.2 million. By 1980, the number of women in the high-fertility age groups increased to 31.4 million.[12] However, age-specific fertility rates decreased and the number of births did not reach the previous high level.

TABLE 5.—CRUDE BIRTH RATES AND TOTAL FERTILITY RATES FOR THE U.S.S.R. AND REPUBLICS: 1950 TO 1980

Republic	Crude birth rate				Total fertility rate			
	1950	1960	1970	1980	1965–66	1971–72	1975–76	1979–80
U.S.S.R.	26.7	24.9	17.4	18.3	2.46	2.47	2.39	2.26
Lithuania	23.6	22.5	17.6	15.1	2.23	2.38	2.18	2.01
Latvia	17.0	16.7	14.5	14.0	1.73	2.01	1.95	1.88
Estonia	18.4	16.6	15.8	15.0	1.92	2.19	2.08	2.01
R.S.F.S.R	26.9	23.2	14.6	15.9	2.12	2.05	1.97	1.89
Ukraine	22.8	20.5	15.2	14.8	1.99	2.12	2.02	1.96
Belorussia	25.5	24.4	16.2	16.0	2.28	2.34	2.14	2.04
Moldavia	38.9	29.3	19.4	20.0	2.68	2.63	2.52	2.38
Georgia	23.5	24.7	19.2	17.7	2.60	2.61	2.52	2.25

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[9] TsSU, Narodnoye khozyaystvo SSSR v 1979 g.; statisticheskiy yezhegodnik, Moscow, Statistika, 1980, pp. 18–22.

[10] U.S. Bureau of the Census, Population Projections by Age and Sex: for the Republics and Major Economic Regions of the U.S.S.R. 1970 to 2000, Series P-91, No. 26, Washington, D.C., 1979. TsSU, Narodnoye khozyaystvo SSSR v 1980 g.; statisticheskiy yezhegodnik, Moscow, Finansy i Statistika, 1981, p. 31.

[11] Frederick A. Leedy, "Demographic Trends in the U.S.S.R.," in Congress of the United States, Joint Economic Committee, Soviet Economic Prospects for the Seventies, 93rd Congress, 1st Session, Washington, D.C., 1973, p. 439.

[12] Unpublished estimates and projections prepared by the U.S. Bureau of the Census in May 1982.

TABLE 5.—CRUDE BIRTH RATES AND TOTAL FERTILITY RATES FOR THE U.S.S.R. AND REPUBLICS: 1950 TO 1980—Continued

Republic	Crude birth rate				Total fertility rate			
	1950	1960	1970	1980	1965–66	1971–72	1975–76	1979–80
Azerbaydzhan	31.2	42.6	29.2	25.2	5.27	4.30	3.92	3.33
Armenia	32.1	40.1	22.1	22.7	3.91	3.17	2.79	2.38
Kazakhstan	37.6	37.2	23.4	23.8	3.50	3.37	3.26	2.94
Uzbekistan	30.8	39.8	33.6	33.8	5.56	5.84	5.66	4.90
Kirgiziya	32.4	36.9	30.5	29.6	4.71	4.97	4.85	4.13
Tadzhikistan	30.4	33.5	34.8	37.0	5.49	6.15	6.31	5.76
Turkmenia	38.2	42.4	35.2	34.3	6.04	5.90	5.71	5.13

Sources: Crude birth rates for 1950 through 1970 from U.S. Bureau of the Census, Population Projections by Age and Sex: for the Republics and Major Economic Regions of the U.S.S.R. 1970 to 2000, Series P-91, No. 26, Washington, D.C. 1979, p. 5; and for 1980 from TsSU, Narodnoye khozyaystvo SSSR v 1980 g.; statisticheskiy yezhegodnik, Moscow, Finansy i Statistika, 1981, pp. 32–33. Total fertility rates for 1965/66 through 1975/76 from B. Ts. Urlanis (Ed.), Narodo-naseleniye stran mira, spravochnik, Moscow, Statistika, 1978, pp. 74–78. Those for 1979/80 were calculated from birth rates by age of mother published in Vestnik statistiki, no. 11, November 1981, p. 71.

Two sets of fertility rates are shown in table 5: crude birth rates and total fertility rates, both disaggregated by republic. The crude birth rate for the U.S.S.R. (births per 1,000 population) shows a declining trend for the earlier years and a slight increase by 1980. The increase was caused by the relatively large number of women in the primary reproductive age groups. The second portion of the table gives total fertility rates which are better fertility indicators since they provide measures of fertility that are independent of changes in the sex and age composition of the population.[13] The data indicate little change in fertility between 1965/1966 and 1971/1972 for most republics. After 1971/1972 total fertility rates started declining for all republics. The rate of decrease was greater, in most instances among southern tier republics compared to the European republics. Armenia experienced the largest decrease, 25 percent. Among the Muslim republics Azerbaydzhan had the largest decrease, 23 percent; Tadzhikistan had the lowest decrease, 6 percent. By the end of the 1970's the European republics, with the exception of Moldavia, had total fertility rates below 2.1. These low levels of fertility, if continued for an extended length of time, would result in population declines in the European republics.

G. MORTALITY

Soviet mortality rates have been rising in recent years. Data in table 6 show a rise in the crude death rate, defined as the number of deaths per 1,000 population. This measure is affected by changes in the age structure of the population and thus an increase may reflect aging of the population instead of an increase in age-specific mortality. Nevertheless, it is worth noting that between 1970 and 1980 crude death rates increased in all republics. Life expectancy at birth for males dropped from 67 years in 1964 to an estimated 62 years in 1980, the life expectancy at birth for females decreased during the same period from 76 to 73 years.[14] Thus, the difference in life expectancy between the sexes increased from 9 to 11 years. Table 6 also shows an eleven year difference in life expectancy between the sexes for the U.S.S.R. in 1975. By republic, the maximum difference is 12 years for Kazakhstan followed by 11 years for the R.S.F.S.R. In contrast the sex differential was only 6 years in Moldavia and Tadzhikistan.

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[13] The total fertility rate is the number of children a woman would have in a lifetime if she were to experience the same fertility rates year by year that were experienced by all women in a given year.

[14] Unpublished estimates and projections prepared by the U.S. Bureau of the Census in June 1972 and in May 1982.

TABLE 6.—CRUDE DEATH RATE AND LIFE EXPECTANCY AT BIRTH BY SEX FOR THE U.S.S.R. AND REPUBLICS: 1950 TO 1980

Republic	Crude death rate				Life expectancy at birth, 1975	
	1950	1960	1970	1980	Male	Female
U.S.S.R	9.7	7.1	8.2	10.3	63	74
Lithuania	12.0	7.8	8.9	10.5	67	77
Latvia	12.4	10.0	11.2	12.7	64	75
Estonia	14.4	10.5	11.1	12.3	65	75
R.S.F.S.R	10.1	7.4	8.7	11.0	62	73
Ukraine	8.5	6.9	8.9	11.4	65	74
Belorussia	8.0	6.6	7.6	9.9	67	77
Moldavia	11.2	6.4	7.4	10.2	63	69
Georgia	7.6	6.5	7.3	8.6	68	77
Azerbaydzhan	9.6	6.7	6.7	7.0	64	72
Armenia	8.5	6.8	5.1	5.5	70	77
Kazakhstan	11.7	6.6	6.0	8.0	63	75
Uzbekistan	8.7	6.0	5.5	7.4	64	72
Kirgiziya	8.5	6.1	7.4	8.4	62	71
Tadzhikistan	8.2	5.1	6.4	8.0	62	68
Turkmenia	10.2	6.5	6.6	8.3	62	69

Sources: Crude death rates for 1950 through 1970 from U.S. Bureau of the Census, Population Projections by Age and Sex: for the Republics and Major Economic Regions of the U.S.S.R. 1970 to 2000, Series P-91, No. 26, Washington, D.C. 1979, p. 5; and for 1980 from TsSU, Narodnoye khozyaystvo SSSR v 1980 g; statistickeskiy yezhegodnik, Moscow, Finansy i Statistika, 1981, pp. 32–33. Life expectancy at birth estimated by the U.S. Bureau of the Census, op. cit., p. 22.

The Soviet Union published age-specific death rates by 5-year age groups for 1975–1976 and age-and-sex-specific rates, also by 5-year age group for the years 1958–1974.[15] Inspection of male mortality rates indicates an increase beginning in the mid-1960's for virtually all age groups above age 20 years. In the 20–24 year age group, the rate increased by 19 percent between the low point in 1969/1970 and the last reported rate in 1973/1974. However, the maximum increase of 37 percent occurred for the 40–44 year age group between a low in 1963–1964 and the last reported rate in 1973–1974. A modest increase in female mortality also began in the mid-1960's but was confined largely to the older age groups.

The rise in mortality has not been confined to the adult population but extended to infant mortality in the early 1970's. Official Soviet statistics indicate that the infant mortality rate (the number of deaths to infants under one year of age per 1,000 live births) declined during the 1950's and 1960's from a rate of 80.7 in 1950 to a low of 22.9 in 1971.[16] Thereafter, the trend was reversed and by

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[15] John Dutton, Jr., "Changes in Soviet Mortality Patterns, 1959-77," Population and Development Review, Vol. 5, No. 2, June 1975, pp. 276-7.

[16] Christopher Davis and Murray Feshbach, *Rising Infant Mortality in the U.S.S.R. in the 1970's*, Series P-95, No. 74, Bureau of the Census, Washington, D.C., 1980, p. 5, and TsSu, *Naseleniye* SSSR 1973 (chislenost' sostav i dvizheniye naseleniya); statisticheskiy sbornik, Moscow, Statistika, 1975, p. 141.

1974, the last year for which an official figure is available, the infant mortality rate increased to 27.9. A secondary Soviet source published an infant mortality rate of 30.8 for 1975.[17] Davis and Feshbach estimated that the trend continued upward and reached 31.1 in 1976. If the Soviet source for 1975 is accepted, the Soviet infant mortality rate increased 34 percent in the four years between 1971 and 1975, which is a unique event for an industrialized nation. In reporting infant mortality rates, Soviets do not follow the standard international practice but define infant deaths and live births in a manner which has been estimated to lower their infant mortality rate by approximately 14 percent.[18] Essentially, Soviets exclude premature infants born alive who had a gestation period of less than 28 weeks, weight of less than 1,000 grams, were less than 35 centimeters in length, and died within 7 days after birth.[19]

The rise in mortality rates for the adult population has been accepted in the West as representing actual increases. However, doubts have been raised about the reliability of infant mortality data. It has been noted that some increases undoubtedly were genuine, but a portion of the sharp rise was caused by more complete reporting of infant deaths, especially in the Central Asian republics.[20]

H. NATIONALITIES

Soviet population is much more heterogenous ethnically than is generally recognized in the West. In preparing for the 1970 census, for example, the Central Statistical Administration, in consultation with other institutions, established that were 122 indigenous nationalities and ethnic groups living in the Soviet Union who spoke 114 languages. The censuses taken in 1959, 1979, and 1979 are our only complete sources of information on the nationality composition of the Soviet population during the post-war years.

Examination of the nationality data from the last three censuses (table 7), indicates a decreasing share of Russians and other Europeans and a rising proportion of Muslims and other eastern groups as a share of the total Soviet population. In 1959, Slavs comprised 77.1 percent of the population of which the Russian component amounted to 54.6 percent. In 1979, the corresponding proportions were 72.9 percent and 52..4 percent, respectively. In contrast, during the 20 year period, most eastern nationalities had higher than average growth rates, thereby inceasing their share of the Soviet population. The Muslim population increased from 24.7 million to 43.8 million and in relative terms from 11.8 to 16.7 percent of the total.[21]

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[17] Cited in Davis and Feshbach, *op. cit.*, p. 4.

[18] *Ibid.*, p. 7.

[19] *Ibid.*, p. 6.

[20] Unpublished manuscript by Warren W. Eason, "Rising Infant Mortality in the 1970's; a Closer Look at the Evidence and a Reinterpretation of the Trends," June 1981.

[21] Rapawy, *op. cit.*, table 7.

TABLE 7.—POPULATION OF THE U.S.S.R. BY LANGUAGE GROUP, NATIONALITY, AND MAJOR RELIGION: 1959 TO 1979

Language group and nationality	Major religion [1]	Population			Average annual percent change		Percent distribution 1979
		1959	1970	1979	1959 to 1970	1970 to 1979	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Total		[2] 208,826,650	241,720,134	[3] 262,084,654	1.34	0.90	100.00
Slavic		161,028,759	180,371,471	190,746,485	1.04	.62	72.78
Russian	Orthodox	114,113,579	129,015,140	137,397,089	1.12	.70	52.42
Ukrainian	Orthodox/Greek Catholic	37,252,930	40,753,246	42,347,387	.82	.43	16.16
Belorussian	Orthodox	7,913,488	9,051,755	9,462,715	1.23	.50	3.61
Polish	Catholic	1,380,282	1,167,523	1,150,991	−1.51	−.16	.44
Bulgarian	Orthodox	324,251	351,168	361,082	.73	.31	.14
Czech	Catholic	24,557	20,981	17,812	−1.42	−1.80	.01
Slovak	Catholic	14,674	11,658	9,409	−2.07	−2.35	(Z)
Yugoslav	Orthodox	4,998	(NA)		(X)	(X)	(NA)
Turkic		23,157,998	32,353,619	39,774,424	3.09	2.32	15.18
Uzbek	Islam	6,015,416	9,195,093	12,455,978	3.93	3.43	4.75
Kazakh	Islam	3,621,610	5,298,818	6,556,442	3.52	2.39	2.50
Tatar	Islam	4,967,701	5,930,670	6,317,468	1.62	.70	2.41
Azeri	Islam	2,939,728	4,379,937	5,477,330	3.69	2.52	2.09
Turkmen	Islam	1,001,585	1,525,284	2,027,913	3.90	3.22	.77
Kirgiz	Islam	968,659	1,452,222	1,906,271	3.75	3.07	.73
Chuvash	Orthodox/Islam	1,469,766	1,694,351	1,751,366	1.30	.37	.67
Bashkir	Islam	989,040	1,239,681	1,371,452	2.08	1.13	.52
Yakut	Orthodox	236,655	296,244	328,018	2.06	1.14	.13
Karakalpak	Islam	172,556	236,009	303,324	2.89	2.83	.12
Kumyk	Islam	134,967	188,792	228,418	3.10	2.14	.09
Uygur	Islam	95,208	173,276	210,612	5.60	2.19	.08
Gagauz	Orthodox	123,821	156,606	173,179	2.16	1.12	.07
Tuvinian	Lamaism	100,145	139,388	166,082	3.05	1.97	.06
Karachay	Islam	81,403	112,741	131,074	3.01	1.69	.05
Turkish	Islam	35,306	[4] 79,000	92,689	7.60	1.79	.04
Khakass	Orthodox	56,584	66,725	70,776	1.51	.66	.03
Balkar	Islam	42,408	59,501	66,334	3.13	1.22	.03

TABLE 7.—POPULATION OF THE U.S.S.R. BY LANGUAGE GROUP, NATIONALITY, AND MAJOR RELIGION: 1959 TO 1979—Continued

Language group and nationality	Major religion [1]	Population			Average annual percent change		Percent distribution 1979
		1959	1970	1979	1959 to 1970	1970 to 1979	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Altai	Orthodox	45,270	55,812	60,015	1.92	.81	.02
Nogay	Islam	38,583	51,784	59,546	2.71	1.56	.02
Shor	Orthodox	15,274	16,494	16,033	.70	−.31	.01
Karaim	Judaism	5,727	4,571	3,341	−2.03	−3.42	(Z)
Tofalar	Orthodox	586	620	763	.51	2.33	(Z)
Caucasian		4,389,752	5,673,827	6,485,371	2.36	1.50	2.47
Georgian	Orthodox	2,691,950	3,245,300	3,570,504	1.71	1.07	1.36
Chechen	Islam	418,756	612,674	755,782	3.52	2.36	.29
Avar	Islam	270,394	396,297	482,844	3.54	2.22	.18
Lezgin	Islam	223,129	323,829	382,611	3.44	1.87	.15
Kabardian	Islam	203,620	279,928	321,719	2.94	1.56	.12
Dargin	Islam	158,149	230,932	287,282	3.50	2.46	.11
Ingush	Islam	105,980	157,605	186,198	3.67	1.87	.07
Adygy	Islam	79,631	99,855	108,711	2.08	.95	.04
Lak	Islam	63,529	85,822	100,148	2.77	1.73	.04
Abkhazian	Islam/Orthodox	65,430	83,240	90,915	2.21	.99	.03
Tabasaran	Islam	34,700	55,188	75,239	4.31	3.50	.03
Circassian	Islam	30,453	39,785	46,470	2.46	1.74	.02
Abazinian	Islam	19,591	25,448	29,497	2.41	1.65	.01
Rutul	Islam	6,732	12,071	15,032	5.45	2.47	.01
Tsakhur	Islam	7,321	11,103	13,478	3.86	2.18	.01
Agul	Islam	6,709	8,831	12,078	2.53	3.54	(Z)
Udin	Orthodox	3,678	5,919	6,863	4.42	1.66	(Z)
Finno-Ugric		4,291,687	4,483,519	4,448,141	.40	−.09	1.70
Mordvin	Orthodox	1,285,116	1,262,670	1,191,765	−.16	−.64	.45
Estonian	Lutheran	988,616	1,007,356	1,019,851	.17	.14	.39
Udmurt	Orthodox	624,794	704,328	713,696	1.10	.15	.27
Mari	Orthodox	504,205	598,628	621,961	1.57	.43	.24
Komi	Orthodox	287,027	321,894	326,700	1.05	.17	.12

Hungarian	Catholic	154,738	166,451	170,553	.67	.27	.07
Komi-permyak	Orthodox	143,901	153,451	150,768	.59	−.20	.06
Karelian	Orthodox	167,278	146,081	138,429	−1.22	−.60	.05
Finnish	Lutheran	92,717	84,750	77,079	−.81	−1.05	.03
Khant	Orthodox/Shamanism	19,410	21,138	20,934	.78	−.11	.01
Mansi	Orthodox/Shamanism	6,449	7,710	7,563	1.64	−.21	(Z)
Vep	Orthodox	16,374	8,231	8,094	−6.01	−.25	(Z)
Izhor	Orthodox	1,062	781	748	−2.76	−.48	(Z)
Baltic		3,725,633	4,094,788	4,289,942	0.86	0.52	1.64
Lithuanian	Catholic	2,326,094	2,664,944	2,850,905	1.24	.75	1.09
Latvian	Lutheran	1,399,539	1,429,844	1,439,037	.20	.07	.55
Germanic		3,887,469	3,997,024	3,747,090	.25	−.71	1.43
German	Lutheran/Catholic	1,619,655	1,846,317	1,936,214	1.20	.53	.74
Jewish [5]	Judaism	2,267,814	2,150,707	1,810,876	−.48	−1.89	.69
Iranian		1,910,256	2,774,228	3,628,199	3.45	3.03	1.38
Tadzhik	Islam	1,396,939	2,135,883	2,897,697	3.94	3.45	1.11
Ossetian	Islam/Orthodox	412,592	488,039	541,893	1.54	1.17	.21
Kurdish	Islam	58,799	88,930	115,858	3.83	2.98	.04
Iranian (Persian)	Islam	20,766	27,501	31,313	2.59	1.45	.01
T[illegible]	Islam	11,463	17,109	22,441	3.71	3.06	.01
Baluchi	Islam	7,842	12,582	18,997	4.39	4.68	.01
Afghan	Islam	1,855	4,184	(NA)	7.68	(X)	(X)
Romance		2,325,122	2,819,756	3,097,016	1.77	1.05	1.18
Moldavian	Orthodox	2,214,139	2,697,994	2,968,224	1.81	1.07	1.13
Romanian	Orthodox	106,366	119,292	128,792	1.05	.86	.05
Spanish	Catholic	2,446	(NA)	(NA)	(X)	(X)	(X)
Italian	Catholic	1,158	(NA)	(NA)	(X)	(X)	(X)
French	Catholic	1,013	2,470	(NA)	8.44	(X)	(X)
Mongolian		360,799	457,035	502,505	2.17	1.06	.19
Buryat	Orthodox/Shamanism	252,959	314,671	352,646	2.00	1.27	.13
Kalmyk	Buddhism	106,066	137,194	146,631	2.37	.74	.06
Mongol	Buddhism/Shamanism	1,774	5,170	3,228	10.21	−5.10	(Z)

TABLE 7.—POPULATION OF THE U.S.S.R. BY LANGUAGE GROUP, NATIONALITY, AND MAJOR RELIGION: 1959 TO 1979—Continued

Language group and nationality	Major religion [1]	Population			Average annual percent change		Percent distribution 1979
		1959	1970	1979	1959 to 1970	1970 to 1979	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Hellenic		309,308	336,869	343,809	.78	.23	.13
Greek	Orthodox	309,308	336,869	343,809	.78	.23	.13
Indic		132,014	175,335	209,159	2.61	1.98	.08
Gypsy	Orthodox/Islam	132,014	175,335	209,159	2.61	1.98	.08
Tungusic		50,070	57,603	61,191	1.28	.67	0.02
Evenki	Orthodox/Shamanism	24,710	25,149	27,531	.16	1.01	.01
Even	Orthodox/Shamanism	9,121	12,029	12,286	2.55	.24	(Z)
Nanay	Shamanism/Orthodox	8,026	10,005	10,516	2.02	.56	(Z)
Dolgan	Orthodox/Shamanism	3,932	4,877	5,053	1.98	.40	(Z)
Ulch	Shamanism/Orthodox	2,055	2,448	2,552	1.60	.46	(Z)
Udege	Shamanism/Orthodox	1,444	1,469	1,551	.16	.61	(Z)
Oroch	Shamanism/Orthodox	782	1,089	1,198	3.06	1.07	(Z)
Negidal	Orthodox/Shamanism	(NA)	537	504	(X)	−.70	(Z)
Samoyed		29,315	35,824	36,214	1.84	.12	.01
Nenets	Orthodox/Shamanism	23,007	28,705	29,894	2.03	.45	.01
Selkup	Orthodox/Shamanism	3,768	4,282	3,565	1.17	−2.02	(Z)
Saam	Orthodox/Shamanism	1,792	1,884	1,888	.46	.02	(Z)
Ngnasan	Orthodox/Shamanism	748	953	867	2.23	−1.05	(Z)
Sino-Tibetan		47,709	38,644	51,694	−1.90	3.29	.02
Chinese	Buddhism	25,781	(NA)	(NA)	(X)	(X)	(X)
Dungan	Islam	21,928	38,644	51,694	5.29	3.29	.02
Paleo-Asiatic		24,301	28,602	29,603	1.49	.38	.01
Chukchi	Shamanism	11,727	13,597	14,000	1.35	.33	.01
Koryak	Shamanism	6,287	7,487	7,879	1.60	.57	(Z)

Nivkhi	Shamanism	3,717	4,420	4,397	1.59	−.56	(Z)
Itelmen	Orthodox	1,109	1,301	1,370	1.46	.58	(Z)
Ket	Orthodox/Shamanism	1,019	1,182	1,122	1.36	−.58	(Z)
Yukagir	Shamanism/Orthodox	442	615	835	3.05	3.46	(Z)
Semitic		29,790	24,294	25,170	−1.84	.39	.01
Assyrian	Nestorian	21,803	24,294	25,170	1.00	.39	.01
Arab	Islam	7,987	(NA)		(X)	(X)	(X)
Eskimo-Aleut		1,539	1,749	2,056	1.17	1.81	(Z)
Eskimo	Orthodox	1,118	1,308	1,510	1.44	1.61	(Z)
Aleut	Orthodox	421	441	546	.42	2.40	(Z)
Independent languages:							
Armenian	Orthodox	2,786,912	3,559,151	4,151,241	2.25	1.73	1.58
Korean	Shamanism/Confucianism	313,735	357,507	388,926	1.19	.94	.15
Albanian	Orthodox	5,258	4,402	(NA)	−1.60	(X)	(X)
Japanese	Shinto/Buddhism	961	(NA)	(NA)	(X)	(X)	(X)
Vietnamese	Buddhism	838	(NA)	(NA)	(X)	(X)	(X)
Other nationalities		13,231	74,887	66,418	17.07	−1.32	.03

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[1] The religious affiliations of the nationalities given in these tables are based largely on the information in S. A. Tokarev, Etnografiya narodov SSSR; istoricheskiye osnovy byta i kul'tury, Moscow, Izdatel'stvo Moskovskogo Universiteta, 1958. Where a nationality is divided between 2 religions, the religion with a larger following is listed first.

[2] Sum of the parts amounts to 208,822,456 persons.

[3] The figures in the column represent de jure population, or permanent residents of the country. The de facto population, or those present in the country at the time of the census, totaled 262,436,000.

[4] This figure was not published in the 1970 census results but was reported with the preliminary 1979 census results which included the data for both the 1970 and the 1979 censuses. The residual in the 1970 census results was reduced by 79,000.

[5] The figures include a small share of Oriental or Sephardi Jews whose native language is not Yiddish but one of the languages of the Caucasus or of Central Asia.

[6] This figure was not published in the 1959 census results but was reported in the 1970 results. The residual in the 1959 census was reduced by 3,932.

NA=Not available. X=Not applicable. Z=Less than 0.005 percent.

Sources: Data for 1959 from TsSU, Itogi Vsesoyuznoy perepisi naseleniye 1959 goda; SSSR (svodnyy tom), Moscow, Gosstatizdat, 1962, pp. 184–189; for 1970 from TsSU, Itogi Vsesoyuznoy perepisi naseleniye 1970 goda, vol. IV, Moscow, Statistika, 1973, pp. 20–22; and for 1979 from Vestnik statistiki, July, no. 7, 1980, pp. 41–43.

Differential fertility is the principal reason for the changing proportions among the Soviet nationalities. The phenomenon can best be illustrated by comparing total fertility rates for the Russian Republic and the Uzbek Republic currently the most populous Muslim Turkic republic. The republic data has to be used as a surrogate since vital statistics are published by administrative units and not by nationality. Nationality figures would be preferable, but surrogate data are sufficiently accurate for our purpose. In 1965-66, the total fertility rate in the Russian Republic amounted to 2.12 children per woman compared to 5.56 (or 162 percent higher) in the Uzbek Republic. By 1979-80, the total fertility rates in the two republics, decreased to 1.89 and 4.90, respectively. The decreases had virtually no effect on the relative difference between the two republics as the Uzbek rate was still 159 percent higher than that for the Russian Republic.

The decreasing share of Russians though unmistakable does not appear to be very marked; during the 20 year period from 1959 to 1979, the Russian share of the total Soviet population dropped only 2.2 percentage points. The small decrease understates the long term trend since the sharp changes are occurring only among the younger age groups which comprise a relatively small share of the total population. Analysis of the younger population by nationality reveals substantial changes in the nationality composition which will take on significant dimensions in the future. In 1959, Hajda reported that Russians comprised 54.0 percent of the population in the 0-9 year age groups; almost equaling their share of the total population. However, by 1970, the Russian share of the 0-10 year age group decreased to 46.8 percent while their share of the total population stood at 53.4 percent.[22] Comparable data are not available for 1979 but based on the decreased share of the Russian population in the census and the substantially higher birth rates in the eastern republics, it is evident that the share of Russians in the younger age groups has continued to decrease. These observations are further strengthened by data on the population 0-9 years of age by republic, from the preliminary 1979 census results. Comparison of these 1979 estimates for the R.S.F.S.R. with the comparable data from the 1970 census shows a 4 percent decrease in the population aged 0-9.[23] Since Russians comprise 82.6 percent of the Republic's population in 1979, the share of Russians in this age group must have continued its decline. In the future, therefore, the Russian share of the total population will be substantially below the current level.

III. FUTURE DEMOGRAPHIC TRENDS, 1980-2000

According to the projections presented in this paper, the population of the U.S.S.R. is expected to number between 288 million and 307 million by the year 2000 (table 8). The principal determinant of the size of the future population will be the assumed trends in fertility. Four fertility trends are postulated for the projections: high, medium, low, and constant. The amount of population increase expected during the period 1980–2000 ranges from more than 42 million for the high series to less than 24 million for the low series. The average annual growth rate for the high series is 0.7 percent, whereas that for the low series is only 0.4 percent. The medium and constant series are intermediate to the high and low series. The medium series shows a population increase of almost 33 million and an average annual growth rate of 0.6 percent. The corresponding figures for the constant series are 36 million and 0.6 percent.

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[22] Lubomyr Hajda, "Nationality and Age in Soviet Population Change," *Soviet Studies*, No. 4, October 1980, pp. 485 and 487.

[23] The percentage was computed from estimates by Murray Feshback, "Between the Lines of the 1979 Soviet Census," *Problems of Communism*, No. 1, January-February 1982, p. 34.

TABLE 8.—ESTIMATED AND PROJECTED TOTAL POPULATION, AND VITAL RATES FOR THE U.S.S.R.: 1950–2000 [1]

Year	Population		Natural increase		Births		Deaths	
	Jan. 1	July 1	Number	Rate	Number	Rate	Number	Rate
ESTIMATES								
1950	178,547	180,075	3,060	17.0	4,805	26.7	1,745	9.7
1955	194,415	196,159	3,435	17.5	5,047	25.7	1,613	8.2
1960	212,372	214,329	3,812	17.8	5,341	24.9	1,529	7.1
1965	229,628	230,936	2,563	11.1	4,253	18.4	1,690	7.3
1970	241,640	242,766	2,229	9.2	4,226	17.4	1.996	8.2
1971	243,891	245,110	2,356	9.6	4,372	17.8	2,015	8.2
1972	246,329	247,501	2,299	9.3	4,404	17.8	2,105	8.5
1973	248,674	249,802	2,222	8.9	4,386	17.6	2,164	8.7
1974	250,930	252,131	2,355	9.3	4,546	18.0	2,191	8.7
1975	253,333	254,469	2,248	8.8	4,611	18.1	2,363	9.3
1976	255,605	256,760	2,293	8.9	4,720	18.4	2,426	9.5
1977	257,916	259,029	2,199	8.5	4,693	18.1	2,495	9.6
1978	260,142	261,253	2,218	8.5	4,763	18.2	2,546	9.7
1979	262,364	263,425	2,141	8.1	4,807	18.2	2,666	10.1
1980	264,486	265,542	2,108	8.0	4,851	18.3	2,744	10.3
1981	266,599	267,697	2,247	8.4	4,999	18.7	2,752	10.3
PROJECTIONS								
High series:								
1982	268,795	270,047	2,504	9.3	5,313	19.7	2,809	10.4
1983	271,299	272,548	2,499	9.2	5,363	19.7	2,864	10.5
1984	273,797	275,033	2,470	9.0	5,384	19.6	2,913	10.6
1985	276,268	277,474	2,413	8.7	5,376	19.4	2,964	10.7
1986	278,680	279,848	2,335	8.3	5,348	19.1	3,013	10.8
1987	281,015	282,138	2,246	8.0	5,307	18.8	3,061	10.8
1988	283,261	284,337	2,152	7.6	5,260	18.5	3,108	10.9
1989	285,413	286,448	2,069	7.2	5,216	18.2	3,148	11.0
1990	287,482	288,488	2,012	7.0	5,180	18.0	3,169	11.0
1995	297,344	398,315	1,941	6.5	5,163	17.3	3,222	10.8
2000	306,941	307,885	1,888	6.1	5,353	17.4	3,465	11.3
Medium series:								
1982	268,795	269,923	2,256	8.4	5,060	18.7	2,804	10.4
1983	271,051	272,158	2,215	8.1	5,071	18.6	2,856	10.5
1984	273,266	274,341	2,150	7.8	5,053	18.4	2,903	10.6
1985	275,416	276,445	2,058	7.4	5,010	18.1	2,951	10.7
1986	277,475	278,449	1,948	7.0	4,947	17.8	2,999	10.8
1987	279,422	280,336	1,828	6.5	4,873	17.4	3,045	10.9
1988	281,250	282,102	1,704	6.0	4,795	17.0	3,091	11.0
1989	282,954	283,750	1,591	5.6	4,720	16.6	3,129	11.0
1990	284,545	284,297	1,504	5.3	4,653	16.3	3,149	11.0
1995	291,556	292,192	1,272	4.4	4,468	15.3	3,197	10.9
2000	297,428	297,936	1,017	3.4	4,450	14.9	3,433	11.5
Low Series:								
1982	268,795	269,799	2,008	7.4	4,807	17.8	2,799	10.4
1983	270,803	271,769	1.931	7.1	4,778	17.6	2,847	10.5

TABLE 8.—ESTIMATED AND PROJECTED TOTAL POPULATION, AND VITAL RATES FOR THE U.S.S.R.: 1950–2000 [1]—Continued

Year	Population		Natural increase		Births		Deaths	
	Jan. 1	July 1	Number	Rate	Number	Rate	Number	Rate
1984	272,734	273,650	1,830	6.7	4,723	17.3	2,892	10.6
1985	274,565	275,417	1,704	6.2	4,643	16.9	2,939	10.7
1986	276,269	277,049	1,561	5.6	4,546	16.4	2,985	10.8
1987	277,830	278,535	1,410	5.1	4,439	15.9	3,030	10.9
1988	279,240	279,868	1,256	4.5	4,330	15.5	3,074	11.0
1989	280,496	281,053	1,114	4.0	4,224	15.0	3,110	11.1
1990	281,609	282,108	997	3.5	4,126	14.6	3,129	11.1
1995	285,770	286,071	602	2.1	3,773	13.2	3,171	11.1
2000	287,922	287,997	150	0.5	3,551	12.3	3,401	11.8
Constant series:								
1982	268,795	269,923	2,256	8.4	5,060	18.7	2,804	10.4
1983	271,051	272,170	2,239	8.2	5,095	18.7	2,586	10.5
1984	273,290	274,389	2,198	8.0	5,102	18.6	2,904	10.6
1985	275,488	276,553	2,130	7.7	5,083	18.4	2,954	10.7
1986	277,618	278,639	2,042	7.3	5,044	18.1	3,002	10.8
1987	279,660	280,632	1,944	6.9	4,993	17.8	3,049	10.9
1988	281,604	282,526	1,842	6.5	4,938	17.5	3,096	11.0
1989	283,447	284,322	1,750	6.2	4,885	17.2	3,135	11.0
1990	285,197	286,039	1,684	5.9	4,840	16.9	3,155	11.0
1995	293,321	294,101	1,560	5.3	4,767	16.2	3,207	10.9
2000	300,871	301,584	1,426	4.7	4,874	16.2	3,448	11.4

[1] Absolute numbers in thousands; rates per 1,000 population. Differences between natural increase and year-to-year changes in the population estimates are due, in varying degrees, to migration and discrepancies in the reporting systems; natural increase may not equal the difference between births and deaths due to rounding. See text for an explanation of the series.

Sources: All of the absolute numbers and rates for 1950–81 are official except the Jan. 1 population estimates for the years 1970, 1972–75, and 1979. The latter numbers were based on the official midyear population estimates and on the official Jan. 1 population estimates for adjacent years. The figures for 1981 are preliminary. Population projections for 1982–2000 were prepared in May 1982 by the U.S. Bureau of the Census. See text for an explanation of the sources, methods, and assumptions used.

The annual growth rates for each series are projected to decline throughout the projection period. The annual growth rate for the high series declines from 0.9 percent to 0.6 percent, the low series rate drops from 0.7 percent to 0.1 percent. The decrease for the medium series is from 0.8 percent to 0.3 percent and for the constant series it is from 0.8 percent to 0.5 percent. The lowest rates for all four series are at the end of the projection period.

Since migration is assumed to be negligible after 1981, the growth rate of each projection is simply the difference between the birth rate and the death rate. All series indicate a gradual increase in the crude death rate. The trends for the other series are similar to that for the medium series which gives an increase of the crude rate from 10.4 deaths per 1,000 population in 1982 to 11.0 per 1,000 in 1988 and 11.5 per 1,000 in the year 2000. All series show a decrease in the crude birth rate but the differences between series are greater than for the crude death rate. The high series shows the birth rate declining from 19.7 births per 1,000 population in 1982 to 17.4 per 1,000 at the end of the century whereas the low series shows a drop from 17.8 to 12.3 per 1,000. The declines for the medium and constant series are from 18.7 to 14.9 per 1,000 and for the constant series it is from 18.7 to 16.2 per 1,000, respectively. All the birth rates at the end of the century are lower than the rate of 18.7 per 1,000 recorded for 1981. The low series birth rate for the year 2000 is only slightly higher than the death rate so the resulting natural increase is very small.

The projected population by 5-year age groups and sex is given in table 9 and the projected population by selected age groups is given in table 10. By the year 2000, the age-sex distributions vary according to the projection series because the size of the young age groups is strongly dependent upon the projected level of fertility. The higher the level of fertility the higher the proportion of young people and the lower the proportion of other age groups. For example, the high series indicates that the population of preschool age (0 to 6 years) will increase from 32 million in 1982 to 35 million in the year 2000 but the low series shows a decline to 25 million. The medium series postulates a slight decline to 30 million and the projected figure for the constant series is almost the same as the 1982 total. All series show an increase in the size of the preschool age population during the mid 1980's followed by a decrease during the late 1980's and early 1990's. All projection series show a relative decrease of the preschool population by the year 2000.

Table 9. ESTIMATED AND PROJECTED POPULATION OF THE U.S.S.R., BY 5-YEAR AGE GROUPS AND SEX: 1970 TO 2000

(Population in thousands as of January 1; figures may not add to totals due to rounding. See text for an explanation of the series)

Sex, age, and series	1970	1975	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1995	2000
BOTH SEXES															
All ages															
High...............	241,640	253,333	264,486	266,599	268,795	271,299	273,797	276,268	278,680	281,015	283,261	285,413	287,482	297,344	306,941
Medium.............						271,051	273,266	275,416	277,475	279,422	281,250	282,954	284,545	291,556	297,428
Low................						270,803	272,734	274,565	276,269	277,830	279,240	280,496	281,609	285,770	287,922
Constant...........						271,051	273,290	275,488	277,618	279,660	281,604	283,447	285,197	293,321	300,871
Under 5 years															
High...............	20,526	21,353	22,870	23,087	23,349	23,949	24,529	25,092	25,602	25,939	25,932	25,832	25,670	24,977	25,386
Medium.............						23,701	23,998	24,240	24,397	24,346	24,164	23,897	23,574	22,104	21,630
Low................						23,453	23,466	23,389	23,191	22,753	22,397	21,962	21,479	19,232	17,878
Constant...........						23,701	24,022	24,312	24,540	24,584	24,518	24,366	24,155	23,224	23,318
5 to 9 years															
High...............	24,495	20,397	21,169	21,516	21,821	22,080	22,421	22,650	22,870	23,133	23,725	24,300	24,858	25,441	24,772
Medium.............											23,481	23,776	24,017	23,365	21,924
Low................											23,238	23,252	23,176	21,289	19,076
Constant...........											23,481	23,799	24,088	23,940	23,034
10 to 14 years															
High...............	25,008	24,468	20,351	20,248	20,293	20,521	20,737	21,111	21,457	21,766	22,023	22,364	22,593	24,797	25,304
Medium.............														23,958	23,313
Low................														23,119	21,242
Constant...........														24,029	23,806
15 to 19 years															
High...............	22,017	24,953	24,376	23,268	22,289	21,394	20,689	20,264	20,162	20,212	20,439	20,654	21,026	22,504	24,707
Medium.............															23,870
Low................															23,034
Constant...........															23,941

Table 9. ESTIMATED AND PROJECTED POPULATION OF THE U.S.S.R., BY 5-YEAR AGE GROUPS AND SEX: 1970 TO 2000--Continued

Sex, age, and series	1970	1975	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1995	2000
20 to 24 years......	17,119	21,907	24,776	25,183	25,443	25,352	24,935	24,182	23,084	22,117	21,230	20,531	20,110	20,869	22,345
25 to 29 years......	13,781	16,996	21,693	22,272	22,727	23,280	24,103	24,513	24,918	25,180	25,090	24,677	23,932	19,906	20,668
30 to 34 years......	21,161	13,638	16,779	18,505	19,735	20,613	20,853	21,390	21,963	22,416	22,961	23,773	24,178	23,607	19,647
35 to 39 years......	16,607	20,873	13,403	11,869	11,318	12,355	14,452	16,477	18,172	19,383	20,244	20,479	21,006	23,752	23,202
40 to 44 years......	19,018	16,295	20,416	20,882	20,522	18,193	15,324	13,084	11,592	11,062	12,078	14,127	16,104	20,529	23,230
45 to 49 years......	12,265	18,544	15,811	15,389	15,460	16,966	18,672	19,796	20,247	19,899	17,637	14,852	12,681	15,627	19,929
50 to 54 years......	9,085	11,860	17,813	18,195	18,200	17,109	15,956	15,142	14,744	14,824	16,275	17,912	18,985	12,147	15,012
55 to 59 years......	12,022	8,643	11,253	12,389	13,670	15,155	16,180	16,811	17,159	17,157	16,122	15,032	14,265	17,917	11,456
60 to 64 years......	9,783	11,190	8,003	7,884	8,093	8,609	9,422	10,427	11,474	12,650	14,008	14,935	15,495	13,114	16.531
65 to 69 years......	7,826	8,777	10,019	9,675	9,138	8,472	7,747	7,143	7,045	7,240	7,706	8,436	9,335	13,781	11,640
70 to 74 years......	5,005	6,649	7,402	7,611	7,840	8,082	8,313	8,457	8,156	7,691	7,121	6,512	6,016	7,909	11,602
75 years and over...	5,922	6,791	8,351	8,627	8,897	9,169	9,463	9,727	10,035	10,348	10,669	10,996	11,230	10,467	11,429
MALE															
All ages															
High.............	111,361	117,544	123,397	124,510	125,640	126,953	128,266	129,565	130,838	132,073	133,265	134,410	135,510	140,636	145,494
Medium...........						126,827	127,995	129,132	130,225	131,264	132,243	133,161	134,019	137,699	140,667
Low..............						126,701	127,725	128,699	129,612	130,455	131,222	131,912	132,528	134,763	135,844
Constant.........						126,827	128,007	129,169	130,298	131,385	132,424	133,411	134,350	138,596	142,415
Under 5 years															
High.............	10,443	10,877	11,625	11,733	11,862	12,167	12,463	12,750	13,009	13,180	13,176	13,126	13,043	12,695	12,912
Medium...........						12,041	12,193	12,317	12,396	12,371	12,278	12,142	11,978	11,235	11,001
Low..............						11,915	11,922	11,883	11,783	11,561	11,380	11,159	10,913	9,775	9,093
Constant.........						12,041	12,205	12,353	12,469	12,492	12,458	12,381	12,273	11,804	11,861
5 to 9 years															
High.............	12,485	10,363	10,758	10,930	11,076	11,199	11,364	11,479	11,587	11,718	12,018	12,311	12,595	12,891	12,560
Medium...........											11,895	12,045	12,168	11,839	11,116
Low..............											11,772	11,780	11,742	10,788	9,672
Constant.........											11,895	12,057	12,204	12,131	11,679

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Table 9. ESTIMATED AND PROJECTED POPULATION OF THE U.S.S.R., BY 5-YEAR AGE GROUPS AND SEX: 1970 TO 2000--Continued

Sex, age, and series	1970	1975	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1995	2000
10 to 14 years															
High	12,741	12,466	10,331	10,274	10,293	10,410	10,522	10,715	10,887	11,037	11,159	11,324	11,438	12,551	12,850
Medium														12,127	11,802
Low														11,702	10,753
Constant														12,162	12,092
15 to 19 years															
High	11,235	12,699	12,397	11,830	11,324	10,862	10,495	10,264	10,208	10,232	10,348	10,460	10,651	11,371	12,482
Medium															12,060
Low															11,637
Constant															12,095
20 to 24 years	8,634	11,143	12,554	12,753	12,879	12,833	12,621	12,238	11,679	11,184	10,728	10,366	10,138	10,523	11,239
25 to 29 years	6,819	8,531	10,965	11,255	11,471	11,735	12,135	12,334	12,531	12,660	12,614	12,406	12,029	9,968	10,352
30 to 34 years	10,417	6,702	8,352	9,228	9,857	10,311	10,442	10,714	10,998	11,214	11,472	11,863	12,058	11,760	9,752
35 to 39 years	8,146	10,189	6,515	5,778	5,528	6,055	7,100	8,108	8,959	9,574	10,013	10,140	10,404	11,713	11,431
40 to 44 years	8,766	7,907	9,833	10,035	9,844	8,716	7,337	6,267	5,561	5,328	5,839	6,845	7,816	10,028	11,299
45 to 49 years	4,747	8,425	7,543	7,354	7,380	8,075	8,858	9,365	9,557	9,375	8,298	6,983	5,965	7,454	9,568
50 to 54 years	3,433	4,495	7,914	8,264	8,377	7,937	7,419	7,060	6,887	6,920	7,575	8,309	8,781	5,582	7,004
55 to 59 years	4,277	3,168	4,123	4,634	5,295	6,104	6,758	7,237	7,554	7,657	7,252	6,777	6,450	8,038	5,101
60 to 64 years	3,522	3,809	2,794	2,740	2,795	2,966	3,261	3,638	4,090	4,676	5,391	5,966	6,383	5,678	7,105
65 to 69 years	2,405	2,976	3,188	3,069	2,910	2,723	2,514	2,330	2,288	2,336	2,482	2,731	3,047	5,345	4,748
70 to 74 years	1,520	1,889	2,316	2,371	2,402	2,425	2,452	2,474	2,378	2,252	2,106	1,945	1,806	2,377	4,173
75 years and over	1,772	1,904	2,189	2,264	2,347	2,436	2,526	2,594	2,667	2,731	2,792	2,858	2,907	2,660	2,915
FEMALE															
All ages															
High	130,279	135,789	141,089	142,089	143,155	144,345	145,532	146,702	147,842	148,942	149,996	151,003	151,972	156,708	161,447
Medium						144,224	145,271	146,284	147,250	148,159	149,007	149,793	150,526	153,857	156,761
Low						144,102	145,010	145,866	146,657	147,375	148,018	148,583	149,081	151,007	152,078
Constant						144,224	145,282	146,319	147,320	148,275	149,181	150,035	150,847	154,726	158,456

Table 9. ESTIMATED AND PROJECTED POPULATION OF THE U.S.S.R., BY 5-YEAR AGE GROUPS AND SEX: 1970 TO 2000--Continued

Sex, age, and series	1970	1975	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1995	2000
Under 5 years															
High	10,083	10,476	11,245	11,355	11,487	11,782	12,066	12,342	12,593	12,759	12,755	12,706	12,627	12,282	12,474
Medium						11,660	11,805	11,924	12,001	11,975	11,886	11,755	11,596	10,869	10,628
Low						11,539	11,544	11,506	11,408	11,192	11,017	10,803	10,565	9,457	8,785
Constant						11,660	11,817	11,959	12,071	12,092	12,060	11,985	11,881	11,419	11,458
5 to 9 years															
High	12,010	10,034	10,412	10,586	10,745	10,881	11,057	11,172	11,283	11,415	11,706	11,989	12,263	12,550	12,212
Medium											11,586	11,730	11,849	11,526	10,808
Low											11,466	11,472	11,434	10,502	9,404
Constant											11,586	11,742	11,884	11,809	11,355
10 to 14 years															
High	12,267	12,002	10,021	9,974	10,000	10,111	10,215	10,395	10,570	10,728	10,864	11,040	11,155	12,245	12,534
Medium														11,831	11,511
Low														11,417	10,488
Constant														11,866	11,794
15 to 19 years															
High	10,782	12,254	11,979	11,438	10,964	10,532	10,194	10,000	9,954	9,980	10,091	10,194	10,374	11,133	12,2[illegible]4
Medium															11,8[illegible]1
Low															11,397
Constant															11,846
20 to 24 years	8,485	10,763	12,222	12,430	12,564	12,519	12,314	11,944	11,405	10,933	10,501	10,165	9,971	10,346	11,106
25 to 29 years	6,962	8,465	10,728	11,018	11,256	11,545	11,968	12,179	12,387	12,521	12,476	12,271	11,903	9,938	10,316
30 to 34 years	10,744	6,936	8,427	9,277	9,877	10,302	10,411	10,676	10,965	11,202	11,489	11,911	12,120	11,847	9,896
35 to 39 years	8,460	10,634	6,888	6,091	5,790	6,300	7,352	8,368	9,213	9,809	10,231	10,339	10,602	12,038	11,771
40 to 44 years	10,252	8,387	10,583	10,846	10,679	9,478	7,987	6,817	6,030	5,734	6,240	7,282	8,288	10,501	11,930
45 to 49 years	7,518	10,119	8,268	8,035	8,080	8,892	9,814	10,432	10,691	10,524	9,339	7,869	6,717	8,174	10,361
50 to 54 years	5,652	7,365	9,899	9,931	9,823	9,172	8,537	8,082	7,857	7,905	8,700	9,603	10,204	6,565	8,007
55 to 59 years	7,746	5,475	7,130	7,755	8,375	9,051	9,423	9,575	9,605	9,500	8,870	8,255	7,815	9,879	6,355
60 to 64 years	6,261	7,382	5,209	5,144	5,298	5,642	6,161	6,789	7,384	7,974	8,617	8,969	9,111	7,436	9,426
65 to 69 years	5,420	5,801	6,830	6,806	6,228	5,748	5,233	4,813	4,758	4,904	5,224	5,705	6,288	8,436	6,892
70 to 74 years	3,486	4,760	5,086	5,240	5,438	5,658	5,861	5,984	5,778	5,439	5,015	4,568	4,210	5,532	7,429
75 years and over	4,151	4,887	6,162	6,363	6,550	6,733	6,938	7,133	7,369	7,618	7,877	8,138	8,323	7,807	8,514

Sources: Population projections prepared in May 1982 by the U.S. Bureau of the Census. See text for an explanation of the sources, methods, and assumptions used.

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Table 10. ESTIMATED AND PROJECTED POPULATION OF THE U.S.S.R., BY SELECTED AGE GROUPS: 1970 TO 2000

(Population in thousands as of January 1; see text for an explanation of the series)

Population group, sex, and series	1970	1975	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1995	2000
Preschool ages (0 to 6 years)															
High	29,677	29,377	31,489	31,908	32,323	32,999	33,617	34,280	34,871	35,396	35,837	36,087	35,993	35,044	35,295
Medium						32,751	33,085	33,429	33,665	33,803	33,826	33,628	33,299	31,247	30,300
Low						32,503	32,554	32,577	32,459	32,210	31,815	31,170	30,605	27,451	25,312
Constant						32,751	33,110	33,501	33,808	34,041	34,180	34,121	33,951	32,662	32,498
School ages (7 to 16 years)															
High	49,356	47,126	42,014	41,522	41,461	41,705	42,064	42,550	43,107	43,709	44,274	44,845	45,693	49,305	50,414
Medium													45,450	47,314	46,236
Low													45,207	45,324	41,959
Constant													45,450	47,664	47,481
Military entry age-males (18 years)	2,229	2,466	2,602	2,484	2,381	2,234	2,109	2,100	2,021	2,014	2,004	2,053	2,124	2,273	2,404
Able-bodied ages[1]															
High	130,589	143,063	154,776	156,026	156,832	157,364	157,747	158,099	158,369	158,545	158,977	159,572	160,113	162,393	168,696
Medium															168,176
Low															167,655
Constant															168,199
Males (16 to 59 years)															
High	64,056	70,627	77,950	79,010	79,844	80,596	81,140	81,573	81,871	82,009	81,993	82,013	82,087	84,119	85,628
Medium															85,365
Low															85,102
Constant															85,377
Females (16 to 54 years)															
High	66,532	72,435	76,827	77,016	76,988	76,768	76,608	76,526	76,498	76,535	76,985	77,559	78,026	78,274	83,068
Medium															82,811
Low															82,554
Constant															82,823
Retirement ages	36,282	38,883	40,905	41,552	42,344	43,383	44,368	45,329	46,316	47,429	48,374	49,135	49,890	55,149	57,557
Males (60 years and over)	9,219	10,579	10,488	10,444	10,454	10,550	10,753	11,035	11,422	11,995	12,771	13,500	14,142	16,060	18,941
Females (55 years and over)	27,064	28,304	30,417	31,108	31,889	32,832	33,615	34,294	34,894	35,434	35,603	35,635	35,748	39,089	38,616

[1] Officially defined as males 16 to 59 years and females 16 to 54 years, inclusive.

Source: Population projections prepared in May 1982 by the U.S. Bureau of the Census. See text for an explanation of the sources, methods, and assumptions used.

The school age population (ages 7 to 16 years) is expected to increase moderately but steadily through most of the projection period. All series show increases to 1995 and the high series indicates a further increase to the year 2000. The low series shows a considerable decrease between 1995 and 2000 but the projected figure for the end of the century is still larger than that for 1982. The number of males aged 18 years (the military entry age) is expected to decline until the late 1980's and then increase such that the number at the end of the projection period is almost the same as the number in 1982.

The working age population is expected to increase very slowly through most of the projection period. After increasing by over 26 million between 1970 and 1982 the working age population is likely to grow by less than 6 million between 1982 and 1995. It is then expected to increase by another 5 to 6 million by the end of the century. The proportion of the total population in the working ages, which rose from 54.0 percent in 1970 to an estimated 58.5 percent in 1980, is expected to decline to 55.7 percent by 1995 before increasing slightly to 56.4 percent by the end of the century (medium series).

The population of retirement age is expected to increase at a significant rate throughout the projection period. The total should rise by 15 million—from 42 million in 1982 to about 58 million in the year 2000. The proportion of the total population in the retirement ages is likely to increase from about 16 percent in 1982 to between 19 and 20 percent in the year 2000. Another indicator of the aging of the Soviet population is the median age, which is expected to increase from 28.6 years in 1982 to between 32.6 and 35.0 years in the year 2000.

IV. SOURCES, METHODS, AND ASSUMPTIONS

The projections presented here supersede all others for the U.S.S.R. prepared previously by the U.S. Bureau of the Census.[24] The official data used in these projections are taken from a number of official publications, the most important of which were the 1959 and 1970 Soviet census reports, various issues of *Vestnik statistiki*, three series of statistical handbooks: *Narodnoye khozyaystvo SSSR v 19—g., statisticheskiy yezhegodnik; SSSR v tsifrakh v 19—godu, kratkiy statisticheskiy sbornik; and Statisticheskiy yezhegodnik stran-chlenov Soveta ekonomicheskoy vzaimopomoshchi 19—*, and a population handbook: *Naseleniye SSSR 1973, statisticheskiy sbornik*. The projections were prepared by the cohort-component method based on data available as of May 1982. This method involves carrying forward a reported or estimated age-sex distribution on the basis of various assumptions concerning the components of population change (i.e., births, deaths, and migration).

The base 1982 population was derived from the distribution reported for the 1970 census. The 1970 census data by 5-year age groups were distributed by single years of age on the basis of data from the 1959 census, information on annual numbers of births, and various other data.[25] The base population by age and sex as derived from the January 15, 1970 census data was adjusted pro rata to equal the estimated population totals by sex for January 1, 1970. Reported and estimated data on births and deaths for the years 1970–1981 and reported and estimated population figures by sex for the years 1970–1982 were used for estimating the population at January 1, 1982. The distribution for the beginning of 1982 was projected to the end of the century on the basis of various assumptions regarding fertility, mortality, and migration. Migration was assumed to be insignificant throughout the projection period. During the last several years there has been some movement of Jews, Germans, Armenians, and others out of the U.S.S.R., but the numbers involved have been relatively small and the future course of this emigration is uncertain.

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[24] The most recent published projections for the U.S.S.R. prepared by the U.S. Bureau of the Census were presented in U.S. Bureau of the Census, Population Projections by Age and Sex: For the Republics and Major Economic Regions of the U.S.S.R.: 1970 to 2000, Series P-91, No. 26, Washington, D.C., 1979.

Four series of projections incorporating alternate fertility assumptions were prepared. The constant series assumes that fertility will remain at the estimated 1981 level throughout the projection period. The other three series were designed to give a reasonable range of possible future trends in fertility. The assumptions for each series were formulated in terms of gross reproduction rates.[26] The assumed rates for each year are given in table 11. The medium series implies a moderate decline of about 9 percent over the projection period. This decrease is approximately equal to the decline in the estimated gross reproduction rate between 1971 and 1981. The rate for the year 2000 is slightly below the level necessary for the eventual replacement of the population. The assumed rates for the high and low series for the year 2000 are 20 percent above and 20 percent below the rate for the medium series. The level of fertility at the end of the century for the high series is the same as in 1970 and that for the low series is well below the replacement level but still higher than the current rates for some European countries. The assumed 1982 rates for the high and low series were set far enough apart so that the actual 1982 fertility level will likely fall within the range indicated by these two series. The rates for the years 1983–1999 were obtained by linear interpolation between the assumed rates for 1982 and 2000. Age-specific fertility rates reported for 1979–1980 were adjusted to yield the reported number of births for 1981. For each series and each year these adjusted fertility rates were multiplied by the ratio of the assumed gross reproduction rate to the 1981 gross reproduction rate to obtain the projected age-specific fertility rates, which, in turn, were applied to the female population in the reproductive ages to get the projected number of births. Female births were assumed to be 48.8 percent of total births. This figure was calculated from reported births by sex for the years 1972–1974.

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[25] For a detailed explanation of how this distribution by single years of age was derived, see U.S. Department of Commerce, Estimates and Projections of the Population of the U.S.S.R., by Age and Sex: 1950 to 2000, International Population Reports, Series P-91, No. 23, Washington, D.C., March 1973.

[26] The gross reproduction rate is defined as the number of daughters that would be born to a woman during her reproductive lifetime if a given set of birth rates by age of mother remains in effect.

Table 11. ESTIMATED AND ASSUMED GROSS REPRODUCTION RATES AND ESTIMATED AND ASSUMED LIFE EXPECTANCIES AT BIRTH, BY SEX, FOR THE U.S.S.R.: 1970 TO 2000

Year	Gross reproduction rate				Life expectancy at birth	
	High	Medium	Low	Constant	Male	Female
Estimated:						
1970	1.20				64.6	74.3
1971	1.21				64.8	74.7
1972	1.19				64.5	74.2
1973	1.15				64.4	74.1
1974	1.16				64.3	74.7
1975	1.15				63.2	73.8
1976	1.15				63.1	73.9
1977	1.12				62.7	74.1
1978	1.11				62.6	74.3
1979	1.09				62.0	73.8
1980	1.08				61.9	73.5
1981	1.10				62.3	73.9
Assumed:						
1982	1.15	1.10	1.04	1.10	62.3	73.9
1983	1.15	1.09	1.03	1.10	62.3	73.9
1984	1.16	1.08	1.01	1.10	62.3	73.9
1985	1.16	1.08	1.00	1.10	62.3	73.9
1986	1.16	1.07	0.99	1.10	62.3	73.9
1987	1.16	1.07	0.97	1.10	62.3	73.9
1988	1.17	1.06	0.96	1.10	62.3	73.9
1989	1.17	1.06	0.95	1.10	62.3	73.9
1990	1.17	1.05	0.93	1.10	62.3	73.9
1991	1.18	1.05	0.92	1.10	62.4	74.0
1992	1.18	1.04	0.91	1.10	62.5	74.1
1993	1.18	1.04	0.89	1.10	62.6	74.2
1994	1.18	1.03	0.88	1.10	62.7	74.3
1995	1.19	1.03	0.87	1.10	62.8	74.4
1996	1.19	1.02	0.85	1.10	62.9	74.5
1997	1.19	1.02	0.84	1.10	63.0	74.6
1998	1.19	1.01	0.83	1.10	63.1	74.7
1999	1.20	1.01	0.81	1.10	63.2	74.8
2000	1.20	1.00	0.80	1.10	63.3	74.9

Source: Estimates and assumptions prepared by the U.S. Bureau of the Census in May 1982.

Only one assumption was made about the future course of mortality, namely that the increase observed during the past several years will cease and mortality will be stable until 1990 and then decrease gradually until the end of the century. The decline between 1990 and 2000 was assumed to be equivalent to an increase in life expectancy at birth of one year, for each sex. This modest assumption seems reasonable given the current level of life expectancy in the Soviet Union. Life tables by sex for the projection period were calculated based on the mortality rates from a 1981 estimated life table and the relative change observed between mortality rates of two series of model life tables (Coale-Demeny, West for Males, North for Females) with life expectancies at birth similar to those estimated for 1981 and those projected for 1990 and 2000.[27] The estimated life table for 1981 was derived from the reported total number of deaths for 1981 and the age and sex pattern of mortality for 1973–1974. Survival rates for the years 1982–1990 were assumed to be the same as the estimated rates for 1981. Survival rates for the years 1991–1999 were calculated by interpolating between the rates pertaining to the projected life tables for 1990 and 2000. These rates were used to calculate the numbers of survivors by age and sex for each year in the projection period.

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[27] Ansley J. Coale and Paul Demeny, Regional Model Life Tables and Stable Populations, Princeton, N.J., Princeton University Press, 1966.

TRENDS IN THE SOVIET MUSLIM POPULATION—DEMOGRAPHIC ASPECTS

By Murray Feshbach*

This paper provides a statistical and analytical presentation of the trends in the population of Muslim origin of the Soviet Union (sometimes called "Muslims" alone, without claim for their degree of religious belief), with some predictions of their number and demographic characteristics by the end of the century. The underlying data come from the three postwar censuses, current statistical publications, secondary Soviet sources, and some of my previous writings.

Not very many years ago, most estimates of the population of Muslim origin in the USSR projected a figure of about 50 million at the time of the 1979 census of population and 70–75 million by the end of the century. On the basis of the 1979 census results, it is clear that these figures are too high. Nonetheless, despite the recent slowdown, the rise in numbers of Muslims during the first intercensal period of 1959–1970 was more than 2.4 times the national growth rate of 1.34 percent per year but it climbed to 2.74 times the national growth rate of 0.90 percent per year during 1970–79. In large part , this was due to the drop in the growth rate in the number of Russians from 1.04 to 0.62 percent per year in the two periods, respectively. What underlies the incredible growth differentials between the population of Muslim origin and the remainder of the Soviet population? This issue is analyzed through the discussion of nineteen tables in this paper.

Before commencing the detailed discussion, it is important to note a data issue. The basic problem is that much of the data are available to us only for republics, and not by nationality. In some cases, therefore, the discussion will relate only to republic data because of the lack of corresponding nationality materials. Despite the fact that the republics have titular nationality titles, they contain a wide variety of nationalities, and the shares vary markedly. The paper attempts to clearly designate the scope and coverage of each figure under discussion.

The picture that emerges of demographic trends among the population of Muslim origin is mixed. On one hand, certain traditional Muslim groups such as the Azeris, Kazakhs and Tatars have recently manifested significant drops in their fertility patterns. On the other hand, other groups such as the Tadzhiks and Uzbeks continue to propagate at remarkably high rates albeit slightly lower than in the 1960's. In all, the population of Muslim origin is growing markedly faster than the Slavs and Balts. The outcome of these differentials is demonstrated in such measures as average family size, natural increase rates, families with seven or more members, expected number of children, percent share of the total population, and projected growth of nationality populations.

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Major new information is contained in the table on nationality crude birth rates. These rates were estimated for the first postwar intercensal period of 1959 to 1969 by the late eminent Soviet demographer Urlanis and the recent intercensal period of 1970 to 1978 by Borisov and Kiseleva, two younger demographers who recently joined Rybakovskiy, head of a newly formed demographic unit in the Institute of Sociological Research of the Soviet Academy of Sciences. These estimates are from a document prepared for the Soviet Sociological Association (with a very small number of copies). They allow us to understand the inter-nationality birth rate differentials (in the period 1970 to 1978) between the Muslims of Central Asia with rates between 38 and 42 births per 1000 population and the Slavic range of 13 to 16. The latter rate for Russians of 16.5 (in full detail) and 19.0 in the earlier intercensal period are questionable. Being based on the census figures for the number of Russians, it is of such high magnitude when compared to the republic rate that it may offer proof that the number of individuals who claimed to be Russians in the census (without documentation required) is far in excess of all alternative evidence on their low fertility patterns.

Detailed tables on the physical location of persons of Muslim origin by republic afford us an insight into the remarkably high share of such persons located in the Russian Republic rather than in the 6 traditional Muslim republics (Azerbaydzhan, Kirgiziya, Kazakhstan, Tadzhikistan, Turkmenistan and Uzbekistan). Simultaneously, another important table on the location of the 5 basic nationality groups of Kazakhstan and Central Asia indicates that up to the time of the census of population of 1979, very few had moved out of the region and their share of the national total either was equal to or greater than in 1970. Thus, the national leadership's desires and efforts to encourage movement out of the south to labor-deficit regions had not been successful to date.

Lastly, the table on projections of the nationalities until the year 2000, based on the work of a Kazakh demographer imply extremely little growth in the number of Russians whereas the number of Muslims will have a net growth of some 7 times that of the Russians in the last 21 years of the century. Starting from a much lower base than the number of Russians—whatever the correct number for this group may be—the number of persons of Muslim origin will have a marked impact on the nationality structure of the Soviet population.

The first table, which is a ranking of 38 listed nationalities in the Soviet censuses of population of 1939, 1959, 1970, and 1979, is arranged according to the Bennigsen model which he presented in 1971. The prime purpose of this model was to distribute the Muslims of the USSR by language group. The basic pattern is followed with an internal ranking by size of popultion within each language group in 1979.

The total number of all Muslims grew but at a smaller rate than during the previous intercensal period, dropping to 2.47 percent per year in 1970 to 1979 compared with 3.25 percent per year in the period 1959 to 1970. Nonetheless, this rate of growth (2.47 percent) is more than four times the rate of the Russians alone, who grew by only six-tenths of a percentage point per year; and that may even be exaggerated if one is permitted to question the figures from the census. There was, in particular, an unexpectedly low figure for the Ukrainians according to the census results based on the crude birth rates for the titular republic, and the number of Jews seems too low given our information on emigration, general fertility characteristics, and expected mortality rates, perhaps many of whom also were designated as or choose to opt for "Russian" as documentation is not required for the census.

As expected, table 1 shows that the Uzbeks are the largest single group among all Muslims and now comprise almost 30 percent of the current total number of persons of Muslim origin. Moreover, their share is growing as time passes from 24.3 percent in 1959 to 26.2 in 1970 and to 28.5 percent in 1979. Their ranking also reinforces their standing as among, if not the leading group among all Muslims of the USSR. Although their fertility is declining, it still is not declining as fast as some of the other Muslim groups, particularly the Azeris (or Azerbaydzhanis, if you wish), the Tatars, and the Kazakhs.

TABLE I.—RANKING OF 38 LISTED NATIONALITIES IN THE SOVIET CENSUSES OF POPULATION: 1929, 1959, 1970, AND 1979

Language group and nationality	Absolute numbers				Percent				
					Annual rate of change between 1959 and 1970	Annual rate of change between 1970 and 1979	Of all Muslims		
	1939	1959	1970	1979			1959	1970	1979
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Total	20,669,000	24,738,462	35,158,288	43,772,000	3.25	2.47	100.0	100.0	100.0
Turkic	17,601,600	21,104,170	29,922,808	37,203,000	3.23	2.45	85.3	85.1	85.0
Uzbek	4,844,000	6,015,416	9,195,093	12,456,000	3.93	3.43	24.3	26.2	28.5
Kazakh	3,099,000	3,621,610	5,298,818	6,556,000	3.52	2.39	14.6	15.1	15.0
Tatar	4,300,000	4,967,701	5,930,670	6,317,000	1.62	.70	20.1	16.9	14.4
Azeri	2,275,000	2,939,728	4,379,937	5,477,000	3.69	2.52	11.9	12.5	12.5
Turkmen	812,000	1,001,585	1,525,284	2,028,000	3.90	3.22	4.0	4.3	4.6
Kirgiz	884,000	968,659	1,452,222	1,906,000	3.75	3.07	3.9	4.1	4.4
Bashkir	843,000	989,040	1,239,681	1,371,000	2.08	1.13	4.0	3.5	3.1
Karakalpak	186,000	172,556	236,009	303,000	2.89	2.82	.7	.7	.7
Kumyk	95,000	134,967	188,792	228,000	3.10	2.12	.5	.5	.5
Uygur	109,000	95,208	173,276	211,000	5.60	2.21	.4	.5	.5
Karachay	76,000	81,403	112,741	131,000	3.01	1.68	.3	.3	.3
Turkish	(¹)	35,306	79,000	93,000	7.60	1.83	.1	.2	.2
Balkar	42,600	42,408	59,501	66,000	3.13	1.16	.2	.2	.2
Nogay	36,000	38,583	51,784	60,000	2.71	1.65	.2	.1	.1
Iranian	1,697,000	1,910,256	2,774,228	3,609,000	3.45	2.97	7.7	7.9	8.3
Tadzhik	1,229,000	1,396,939	2,135,883	2,898,000	3.94	3.45	5.6	6.1	6.6
Ossetian	354,000	412,592	488,039	542,000	1.54	1.17	1.7	1.4	1.2
Kurdish	46,000	58,799	88,930	116,000	3.83	3.00	.2	.3	.3
Iranian (Persian)	39,000	20,766	27,501	31,000	2.59	1.34	.1	.1	.1
Tat	29,000	11,463	17,109	22,000	3.71	2.83	(²)	(²)	.1
Baluchi	(¹)	7,842	12,582	(¹)	4.39	(³)	(²)	(²)	(¹)
Afghan	(¹)	1,855	4,184	(¹)	7.68	(³)	(²)	(²)	(¹)
Caucasian	1,343,800	1,694,121	2,422,608	2,908,000	3.31	2.05	6.8	6.9	6.6

Chechen	408,000	418,756	612,674	756,000	3.52	2.36	1.7	1.7	1.7
Avar (D)	[4] 167,000	270,394	396,297	483,000	3.54	2.22	1.1	1.1	1.1
Lezgin (D)	[4] 134,000	223,129	323,829	383,000	3.44	1.88	.9	.9	.9
Kabardian	164,000	203,620	279,928	322,000	2.94	1.57	.8	.8	.7
Dargin (D)	126,000	158,149	230,932	287,000	3.50	2.45	.6	.7	.7
Ingush	92,000	105,980	157,605	186,000	3.67	1.86	.4	.4	.4
Adygy	88,000	79,631	99,855	109,000	2.08	.98	.3	.3	.2
Lak (D)	40,000	63,529	85,822	100,000	2.77	1.71	.3	.2	.2
Abkhazian	59,000	65,430	83,240	91,000	2.21	1.00	.3	.2	.2
Tabasaran (D)	28,000	34,700	55,133	75,000	4.31	3.47	.1	.2	.2
Circassian	(5)	30,453	39,785	46,000	2.46	1.63	.1	.1	.1
Abazinian	14,000	19,591	25,448	29,000	2.41	1.46	.1	.1	(2)
Rutal (D)	13,000	6,732	12,071	15,000	5.45	2.44	(2)	(2)	(2)
Tsakhur (D)	3,300	7,321	11,103	14,000	3.86	2.61	(2)	(2)	(2)
Agul (D)	7,500	6,706	8,831	12,000	2.53	3.47	(2)	(2)	(2)
Sino-Tibetan	4,600	21,928	38,644	52,000	5.29	3.35	.1	.1	.1
Dungan	4,600	21,928	38,644	52,000	5.29	3.35	.1	.1	.1
Semitic	22,000	7,987	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Arab	22,000	7,987	(1)	(1)	(1)	(1)	(1)	(1)	(1)

[1] Not available.

[2] Negligible.

[3] Not applicable.

[4] 1926.

[5] Included with Adygy.

Note.—All Ossetians and Abkhazians are included with the Muslim population, although some are Orthodox. Chuvash and Gypsies, on the other hand, are excluded, although some are Muslims. The eight Caucasian nationalities marked with a "D" are the Peoples of Dagestan sometimes shown as a special sub-group.

Source: 1939; Feshbach, JEC, 1979, p. 693 and 1959–79: Rapawy, "Census," 1980, table 7.

Among the Azeris, the Tatars, and the Kazakhs, there are cogent reasons for some of their decline in fertility, the Tatars certainly traditionally being more assimilated and taking on the lower fertility pattern of the surrounding Russians. The Azeris, I believe, are different from the other Muslims in several directions. First, they are Shi'ite rather than Sunni, their capital Baku was settled by 1870 when they discovered oil, their educational level much higher, and their stage of development seems to have been more advanced than the others. Also Baku itself is about 25–30 percent of the total population of the republic; in all the other Central Asian republics, the capital city populations represent only between 5 and 10 percents, roughly speaking, of the population of each republic. Thus, there is a different concentration, and a different ambience of community relationships and ethnic contacts. The large-scale contact with Slavs in Kazakhstan very likely did have a demographic impact on the Kazakhs.

The second table shows the crude birth rates by republic and are projected up to the year 2000. A report being prepared by the Foreign Demographic Analysis Division (now called the Center for International Demographic and Economic Research of the US Bureau of the Census) will make detailed estimates of birth rates by nationality. We know in some cases, for example, that this projection, made in 1977 for 1980 is too high, and perhaps all the figures are too high. This situation is especially true for the Slavic republics for 1980 and beyond, because the current national figure is 18.3 rather than the 19 as projected and shown in the table. The diversity between the figures around 16 for the Slavic republics and those of 30 to 35 for the Central Asian and Kazakh republics are enormous differentials, and this disparity will ripple throughout all of this paper.

TABLE 2.—ESTIMATED AND PROJECTED CRUDE BIRTH RATES, U.S.S.R. AND BY REPUBLIC: 1950 TO 2000

[Per 1,000 population]

	1950	1960	1970	1980	1990	2000
U.S.S.R.	26.7	24.9	17.4	19.2	17.3	16.1
R.S.F.S.R.	26.1	23.2	14.6	16.6	14.1	13.8
Ukraine	22.8	20.5	15.2	15.6	14.0	13.6
Belorussia	25.5	24.4	16.2	17.3	15.4	13.7
Moldavia	38.9	29.3	19.4	21.3	17.9	16.0
Estonia	18.4	16.6	15.8	14.6	13.7	13.7
Latvia	17.0	16.7	14.5	13.9	13.3	13.3
Lithuania	23.6	22.5	17.6	16.1	15.5	14.0
Armenia	32.1	40.1	22.1	24.4	19.9	16.3
Azerbaydzhan	31.2	42.6	29.2	27.6	26.6	19.8
Georgia	23.5	24.7	19.2	19.2	17.3	15.3
Kazakhstan	37.6	37.2	23.4	24.8	21.5	17.6
Kirgiziya	32.4	36.9	30.5	31.5	28.1	23.2
Tadzhikistan	30.4	33.5	34.8	36.9	33.1	26.6
Turkmenistan	38.2	42.4	35.2	35.0	32.1	26.2
Uzbekistan	30.8	39.8	33.6	35.6	32.2	26.6

Source: Baldwin, Population, 1979, pp. 13–14, 25.27.

Table 3 is a very interesting table; it is a unique table that compares not only the republic as a whole, which we normally have available to us, but it also gives us nationality data in the republic of Uzbekistan for 1959 and 1970, ranging from a low crude birth rate among Russians of 19.3 in 1970 to the high of Uzbeks of 39.2 in the republic. This table is provided by O. B. Ata-Mirzayev, head of the Population Laboratory at Tashkent State University, writing some of the best work and analysis of the demographic situation in Central Asia, particularly Uzbekistan. Table 3 shows a drop in the period 1959 to 1970 in the Uzbek republic crude birth rate from 37.0 to 33.5 per 1000 population, or a 9 percentage point drop, but the Uzbek nationality rate declined by only 6 percentage points, and the Russian rate by 19 percentage points. Because most of the other rates dropped faster, the proportion of children born to Uzbeks increased between 1959 and 1970. Since the republic-wide crude birth rate has continued to increase since 1970 (from 33.5 to 33.9 in 1978 and 34.4 in 1979), very likely the birth rates among Uzbeks has not declined by much if at all. Ata-Mirzayev believes that the rate will stabilize in the future and not decline as predicted by many others. He notes that only among the highly educated, highly urbanized groups is it going down even slightly; this point I believe will be demonstrated by some of the other materials in this paper.

TABLE 3.—NUMBER, CRUDE BIRTH RATE, AND SHARE OF CHILDREN BORN IN UZBEKISTAN, BY NATIONALITY: 1959 AND 1970

Nationality	Number (in percent)		Crude birth rate (per 1,000 population)		Share of childen born (in percent)	
	1959	1970	1959	1970	1959	1970
Total	100.0	100.0	37.0	33.5	100.0	100.0
Uzbeks	62.1	68.5	41.7	39.2	68.9	74.4
Kazakhs	4.2	4.0	34.3	36.9	3.9	4.3
Tadzhiks	3.8	3.8	38.2	34.3	3.9	3.8
Karakalpaks	2.1	2.0	39.1	33.5	2.2	1.9
Kirgiz	1.1	.9	24.4	31.6	.6	.9
Turkmen	.7	.6	32.1	32.8	.6	.6
Russians	13.5	12.5	23.7	19.3	8.3	7.0
Ukrainians	1.1	.9	26.0	23.0	.7	.6
Belorussians	.1	.15	34.4	25.1	.1	.1
Others	11.3	9.65	36.0	22.8	10.8	6.4

Source: O. Ata-Mirzayev and B. Gol'dfarb, "Perspektivy vosproizvodstva naseleniya Sredney Azii," in D. I. Valentey (Ed.), Nashe budushcheye glazami demografa, Vypusk 26, Moscow, Statistika, 1979, p. 117.

Table 4 contains the two series of nationality-related crude birth rates found in Soviet publications. The 1959–1969 table was originally prepared by the late Dr. B. Ts. Urlanis, one of the leading demographers of the Soviet Union. These data make the case very clear about the differentials during the 1960's. The birth rates among the Muslin nationalities shown here is between 41 and 46 for the entire period of 1959 to 1969, while the rates for the country as a whole were distinctly lower, and the Russian, Ukrainian, and Belorussian rates, let alone the Estonian and Latvian rates, even more so. During the most recent period (of 1970 to 1978) between censuses, the Estonian and Latvian crude birth rates were the only nationalities to manifest an increase, with the Georgians estimated to have decreased by over 50 percent, from 24.0 to 18.4

births per 1000 population of this nationality. The lowest decrease in nationality crude birth rate is estimated to have occurred among the Tadzhiks, a decrease of only 7 percentage points. Among the 4 core Central Asian nationalities, the rates dropped to between 38 and 42, the remaining two Muslin nationalities—the Azeris and the Kazakhs—showed deep declines to just over 30, that is, by about 25 percent. The leadership undoubtedly anticipates that this will occur among the remaining Muslin nationality groups—the question remains when, and if so deep?

TABLE 4.—AVERAGE ANNUAL CRUDE BIRTH RATE (CBR), BY NATIONALITY AND TITULAR REPUBLIC: 1959 TO 1969 AND 1970 TO 1978

[Per 1,000 population]

Nationality	CBR						Percent change (1970–78/1959–69)	
	1959–69			1970–78				
	Nationality	Titular republic	N/R	Nationality	Titular republic	N/R	Nationality	Republic
Russians	19.0	18.0	1.056	16.5	15.4	1.071	0.868	0.856
Ukrainians	15.8	17.2	.919	14.0	15.1	.927	.886	.878
Belorussians	19.2	19.9	.965	13.1	15.9	.824	.682	.799
Moldavians	24.7	23.9	1.033	19.3	20.3	.951	.781	.849
Estonians	12.3	15.5	.794	12.8	15.3	.837	1.041	.987
Latvians	12.3	15.1	.815	12.4	14.1	.879	1.008	.934
Lithuanians	20.6	19.6	1.051	16.8	16.2	1.037	.816	.827
Armenians	28.4	31.1	.913	22.5	22.3	1.009	.792	.717
Azeris	43.7	37.6	1.162	31.7	26.0	1.219	.725	.691
Georgians	24.0	21.9	1.096	18.4	18.3	1.005	.467	.836
Kazakhs	41.2	29.8	1.383	30.6	23.9	1.280	.743	.802
Kirgiz	44.0	32.6	1.350	38.4	30.7	1.251	.871	.942
Tadzhiks	45.2	34.5	1.310	41.9	36.5	1.148	.927	1.058
Turkmen	45.6	38.2	1.194	39.5	34.5	1.145	.866	.903
Uzbeks	45.2	35.6	1.270	40.8	30.7	1.329	.903	.862

Source: B. Ts. Urlanis, Problemy dinamiki naseleniya SSSR, Moscow, Nauka, 1974, p. 132, as amended in an unpublished paper, and V.A. Borisov and G.P. Kiseleva, "Aktual'nyye problemy vosproizvodstva naseleniya SSSR v svete resheniy XXVI S'yezda KPSS," in L.L. Rybakovskiy et al. (Eds.), Problemy vosproizvodstva i migratsii naseleniya, Razdel I, Moscow, 1981, p. 20. These are unique sources for this information.

Most interestingly, if these estimates for nationality crude birth rates are reasonably correct by being based on the 1959, 1970 and 1979 census results for the nationalities and, explicitly according to Urlanis' method, the republic crude death rates, the very surprising results for the Russians must be noted. The results are surprising in showing that the nationality rates are higher than the republic rates in each period. This is totally unexpected given all alternative information, inquiries by Soviet demographers into low Russian nationality fertility patterns, regional incentives designed to encourage births among Russians, and so forth. The main conclusion that appears from this methodology and from the contrary pattern emerging from this comparison (of nationality to titular republic rates) is that the number of Russians from the censuses is above feasible levels inasmuch as there has not been any immigration of any magnitude of Russians from any other country to my knowledge during this period. Crude birth rates for Russians much closer to that of the other Slavic groups—Ukrainians and Belorussians would have been more expectable (adjusted for the number who have recorded themselves as Russians for purposes of the census).

One vital question relates to the impact of all of these figures on the size of the population, which then leads to the question of demand for housing, investment policies, labor supplies, educational facilities, regional differentials, and so forth. In part the changing structure and dynamics of the population is shown in table 5, which shows the consequence of these regional differentials. The table provides estimates and projections of the populations ages 0 to 9 by the end of the century by republic groupings. The year 1970 is used as a reference point, and then two different projections are provided for the year 2000. Thus, if the rates prevailing in the period 1975–77 were constant throughout the remaining years of the century, then the 6 Muslim republics of Central Asia, Kazkhstan, and Azerbaydzhan will have a population 0 to 9 years of age about 50 percent greater than the number in the RSFSR in the year 2000 (assuming no large-scale migration in the interval). But we know the rates will not remain constant because of declines in age-specific fertility rates since 1975. It is shown here only as a basis for comparison. The medium series shows a drop to 16,539,000, or 85 percent of the 19,641,000 projected for the RSFSR. (The latter figure for the RSFSR also may not hold given recent crude birth rate information in comparison with that available at the time of the projection—March 1977.) However, a figure of at least 85 percent is a remarkable increase from 52 percent in 1970 (11,105,000 divided by 21,297,000); the number of 0–9 year olds is the future population, labor force, armed forces, progenitors of the forthcoming births, etc.

TABLE 5.—ESTIMATES AND PROJECTION OF THE POPULATION AGED 0–9, U.S.S.R. AND BY REPUBLIC: 1970 AND 2000

[In thousands as of January 1]

U.S.S.R. and republic	1970		2000			
			Medium series		Constant series	
	Number	Percent distribution	Number	Percent distribution	Number	Percent distribution
U.S.S.R.	45,021	100.0	48,037	100.0	50,348	100.0
R.S.F.S.R.	21,297	47.3	19,461	40.5	17,462	34.7
Central Asia, Kazakhstan, and Azerbaydzhan	11,105	24.7	16,539	34.4	25,836	51.3
Central Asia and Kazakhstan	9,549	21.2	14,654	30.5	23,476	46.6
Kazakhstan	3,288	7.3	3,678	7.7	4,470	8.9
Kirgiziya	844	1.9	1,284	2.7	1,654	3.3
Tadzhikistan	973	2.2	1,698	3.5	2,373	4.7
Turkmenistan	689	1.5	1,195	2.5	1,595	3.2
Uzbekistan	3,755	8.3	6,799	14.2	8,914	1.8
Transcaucasus	3,146	7.0	3,515	7.3	4,109	8.2
Of which, Azerbaydzhan	1,556	3.5	1,885	3.9	2,360	4.7

Note.—The medium series implies a modest 6 percent decline in fertility over the projection period, which is reasonable considering the trend in recent years. The constant series for the country as a whole assumes that fertility will remain at the level estimated for 1975 throughout the projection period. Only one assumption was made about the future course of mortality, namely that it will decrease at a modest rate throughout the projection period. It was arbitrarily assumed that the decline in mortality would be equivalent to an increase of 2.5 years in life expectancy at birth between 1975 and 2000.

Source: Based on Baldwin, Projections, 1979, pp. 91–92, 112, 114, and 117–121.

Table 6 provides data on the age distribution of the Soviet population. These data are given by nationality rather than by republic. Unfortunately these data are available only for 1970, never having been published for the 1959 census date. As yet, not a single age datum has been published from the 1979 census. Compared with the publication patterns of the 1959 and 1970 censuses, at least a minimal set of age data for the population as a whole should have been published by this time; it is hoped that this pattern does not portend the non-publication of all age data, especially age by nationality. According to table 6, the very young population group of 0 to 10 years of age represented 37 to 40 percents of the population of Central Asian and Kazakh nationalities, whereas among the Slavic populations it was less than 20 percent in every case in 1970. Thus, even in 1970, the Muslim nationality groups were more than twice as much as the Slavs. Knowing the differential birthrates, we can expect that this gap has grown even more, again reinforcing the differentials for the future. Among all of the Central Asian nationalities, young persons under 16 years of age comprised around 50 percent of their respective populations while among the Slavic nationalities, the 50 percent margin was not reached until the beginning of the 30–39 year old group for the three nationalities.

TABLE 6.—AGE DISTRIBUTION, BY NATIONALITY: JANUARY 15, 1970

Nationality	Total	0–10	11–15	16–19	20–29	30–39	40–49	50–59	60 and over	Not distributed by age
Russians	129,015,140	23,429,675	12,962,024	9,659,595	17,079,960	20,892,773	17,827,807	12,086,310	14,964,868	...
Ukrainians	40,753,246	7,066,001	3,425,130	2,562,407	5,365,872	6,510,874	5,832,705	4,143,772	5,794,802	...
Belorussians	9,051,755	1,738,773	873,827	575,955	1,166,065	1,595,896	1,204,831	727,520	1,165,193	...
Moldavians	2,697,994	617,864	297,277	194,510	316,655	357,552	298,910	204,981	247,772	162,523
Estonians	1,007,356	147,974	65,920	48,043	124,304	134,265	119.501	102,296	197,604	68,079
Latvians	1,429,844	215,689	94,056	64,234	179,944	202,149	170,654	133,817	295,966	73,335
Lithuanians	2,664,944	533,641	225,718	147,856	361,241	390,666	323,564	204,964	396,445	80,849
Armenians	3,559,151	895,936	418,308	251,545	383,917	522,356	382,454	197,892	325,484	181,259
Azeri	4,379,937	1,614,294	580,751	295,277	418,593	601,031	322,288	174,170	292,354	81,179
Georgians	3,245,300	695,604	307,697	206,645	394,323	503,117	392,484	248,548	382,265	114,617
Kazakhs	5,298,818	1,939,130	661,823	379,460	609,154	528,458	378,680	250,391	477,447	74,275
Kirgiz	1,452,222	565,707	186,140	97,668	131,426	159,028	110,053	51,631	123,118	27,451
Tadzhiks	2,135,883	852,301	264,021	140,830	212,368	241,345	155,220	85,463	156,794	27,541
Turkmen	1,525,284	585,914	192,930	102,094	147,103	164,295	114,046	71,046	101,051	46,805
Uzbeks	9,195,093	3,553,570	1,183,250	643,961	903,717	995,826	661,752	377,047	756,269	119,711
Percent distribution:										
Russians	100.00	18.16	10.05	7.49	13.24	16.19	13.82	9.37	11.60	...
Ukrainians	100.00	17.34	8.40	6.29	13.17	15.98	14.31	10.17	14.22	...
Belorussians	100.00	19,21	9.65	6.36	12.88	17.63	13.31	8.04	12.87	...
Moldavians	100.00	22.90	11.02	7.21	11.74	13.25	11.08	7.60	9.18	6.02
Estonians	100.00	14.69	6.54	4.77	12.34	13.33	11.86	10.15	19.62	6.76
Latvians	100.00	15.08	6.58	4.49	12.58	14.14	11.94	9.36	20.70	5.13
Lithuanians	100.00	20.02	8.47	5.55	13.56	14.66	12.14	7.69	14.88	3.03
Armenians	100.00	25.17	11.75	7.07	10.79	14.68	10.75	5.56	9.14	5.09
Azeri	100.00	36.86	13.26	6.74	9.56	13.72	7.36	3.98	6.67	1.85
Georgians	100.00	21.43	9.48	6.37	12.15	15.50	12.09	7.66	11.78	3.53
Kazakhs	100.00	36.60	12.49	7.16	11.50	9.97	7.15	4.73	9.00	1.40
Kirgiz	100.00	38.95	12.82	6.73	9.05	10.95	7.58	3.56	8.48	1.89
Tadzhiks	100.00	39.90	12.36	6.59	9.94	11.30	7.27	4.00	7.34	1.29
Turkmen	100.00	38.41	12.65	6.69	9.64	10.77	7.48	4.66	6.63	3.07
Uzbeks	100.00	38.65	12.87	7.00	9.83	10.83	7.20	4.10	8.22	1.30

Note.—The distribution by age for Russians, Ukrainians, and Belorussians include all persons of these nationalities in all republics of the U.S.S.R. All other nationality date by age are shown only for residents of the titular republics and "other territories of principal residence." In all, these data cover 100 percent of the three Slavic nationalities and 93 to 99 percent of the remaining 12 nationalities. Approximately 10 percent of the total Soviet population belonging to the remaining 100-odd nationalities are not given here.

Source: TsSU SSSR, Itogi Vsesoyuznoy perepisi naseleniya 1970 goda, Tom IV, Moscow, Statistika, 1973, pp. 360–364.

Table 7 contains information on the other side of the demographic balance, the death side of the equation. Again, we lack data on nationality-related measures. Nonetheless, the crude death rates in part must reflect the differential age structures of populations in the republics which in turn reflect the underlying nationality fertility patterns. The differences between the northern tier and the southern tier of the Soviet Union also is demonstrated in the data of this table. Other issues such as male mortality rates due to alcoholism, especially in the Slavic and Baltic republics may also underlie the higher crude death rates in these republics, and infant mortality rates, especially in the Central Asian republics.

TABLE 7.—ESTIMATED AND PROJECTED CRUDE DEATH RATES, U.S.S.R. AND BY REPUBLIC: 1950–2000

[Per 1,000 population]

U.S.S.R. and republic	1950	1960	1970	1980	1990	2000
U.S.S.R.	9.7	7.1	8.2	9.8	10.2	10.6
R.S.F.S.R	10.1	7.4	8.7	10.5	11.4	12.3
Ukraine	8.5	6.9	8.9	10.6	11.5	12.1
Belorussia	8.0	6.6	7.6	8.9	9.2	9.9
Moldavia	11.2	6.4	7.4	9.6	10.0	10.5
Estonia	14.4	10.5	11.1	11.9	12.2	12.7
Latvia	12.4	10.0	11.2	12.5	12.8	13.4
Lithuania	12.0	7.8	8.9	9.8	9.7	10.3
Armenia	8.5	6.8	5.1	5.6	5.5	6.2
Azerbaydzhan	9.6	6.7	6.7	6.9	6.6	6.5
Georgia	7.6	6.5	7.3	8.2	8.4	8.9
Kazakhstan	11.7	6.6	6.0	7.2	7.3	7.6
Kirgiziya	8.5	6.1	7.4	7.8	7.1	6.9
Tadzhikistan	8.2	5.1	6.4	7.7	6.9	6.4
Turkmenistan	10.2	6.5	6.6	7.6	7.0	6.5
Uzbekistan	8.7	6.0	5.5	6.9	5.9	5.4

Source: Baldwin, Population, 1979, pp. 13–14, 25–57.

It should also be noted that the 1980 figures shown in the table are based on a projection made in 1977 and are already somewhat out of date. The rate of 9.8 for the country as a whole in 1980 is too low given the reported figure of 10.3 per 1,000 population officially reported for 1980 in the latest Soviet statistical yearbook; since the later years also are the product of the 1977 projection the figures have been left unchanged. Nonetheless, according to the table, the northern republics of the RSFSR, Ukraine and Belorussia will show an increase in crude death rates from an average of 8.40 per 1,000 in 1970 to 11.43 in 2000, while the crude death rates of the southern republics of the Transcaucasus, Kazakhstan, and Central Asia, will increase only slightly from 6.38 in 1970 to 6.80 in the year 2000. Thus, the differential in the death rates will increase by more than two times from 2.02 in 1970 to 4.63 in the year 2000 (8.40-6.38 and 11.43-6.80, respectively), and will add to the disparity in net growth rates.

The next two tables (8 and 9) on infant mortality are interrelated and must be discussed simultaneously. Unfortunately, the Soviets have decided that the figures are not to be published for any year since that published for 1974. In 1950, the infant mortality rates were 81 per 1,000 live births, and declined remarkably to one-quarter of that level, to 22.9 deaths per 1,000 live births by 1971. However, in 1972, 1973, and 1974, the figures increased remarkably also for an increase of about 20 percent. The publication stopped as noted above. According to the estimates prepared by Dr. Christopher Davis and myself in a report issued by the U.S. Bureau of the Census (Rising Infant Mortality in the U.S.S.R. in the 1970's, Washington, D.C., June 1980), it was determined that the rate was about 35 or 36 for 1978, according to Soviet definition of this rate. (It may have declined since then; see my other paper in this compendium.) The Soviet definition omits children of less than 28 weeks gestation, less than 1,000 grams in weight and less than 35 centimeters in length who die in their first week of life. Based on our calculations, the adjusted figure for the U.S.S.R. should be 39–40 (U.S. definition), or more than three times the infant mortality rate of the United States in 1979. With infant mortality being stated universally as being a prime indicator of the quality of health delivery in a country, the Soviet situation needs much more examination and analysis.

TABLE 8.—INFANT MORTALITY RATES, U.S.S.R. AND BY REPUBLIC: 1958 TO 1974

[Number of deaths per 1,000 live births]

Republic	1958	1960	1965	1970	1974
U.S.S.R	40.6	35.3	27.2	24.7	27.9
Slavic republics:					
R.S.F.S.R	41.0	37.0	27.0	23.0	23.0
Ukraine	38.0	30.0	20.5	17.3	(1)
Belorussia	(1)	[2]34.9	[2]23.1	19.0	17.0
Baltic republics:					
Estonia	39.9	31.2	20.2	17.8	17.6
Latvia	30.0	27.0	19.0	18.0	19.0
Lithuania	(1)	38.0	24.7	19.3	19.4
Transcaucasian republics:					
Armenia	71.0	50.0	38.0	(1)	(1)
Azerbaydzhan	54.0	43.0	49.0	(1)	(1)
Georgia	(1)	36.8	33.9	(1)	(1)
Central Asian republics and Kazakhstan:					
Kazakhstan	(1)	36.8	26.9	(1)	(1)
Kirgiziya	[3]28.0	30.0	35.0	(1)	(1)
Tadzhikistan	35.0	30.0	(1)	(1)	(1)
Uzbekistan	(1)	28.0	30.0	(1)	(1)
Nonreported republics:					
Turkmenistan	(1)	[4]32.8	(1)	(1)	(1)
Moldavia	(1)	[4]32.8	(1)	(1)	(1)

[1] Not available.

[2] TsSU Bel. SSR, Belorusskaya SSR, 1965, 1966, p. 9.

[3] TsSU Kir. SSR, Sovetskiy Kirgizstan, 1966, p. 18.

[4] Infant mortality rates for Turkmenistan and Moldavia have never been published. Rates for all other 13 republics are available for only 2 years during the period 1958–1974. For these 2 years, 1960 and 1967, and estimate for the two republics, in combined form, was made by a residual method. Thus, infant mortality rates for all other republics were multiplied by the number of births in the given year to obtain a figure for all infant deaths in the 13 republics for which rates are known. The sum of these infant deaths was then subtracted from the reported number of infant deaths for the country as a whole and the resultant residual number of deaths was divided by the number of births in the two republics to obtain a combined rate per 1,000 births.

Sources: Except where noted, all statistics are official Soviet figures as reported in Dutton, "An Inquiry," 1979, table 6.

TABLE 9.—INFANT MORTALITY RATES FOR 21 SOVIET CITIES: 1970, 1972, AND 1974

[Number of deaths per 1,000 live births]

City	All infants		
	1970 (1)	1972 (2)	1974 (3)
All U.S.S.R.	24.4	25.7	27.9
R.S.F.S.R., Ukraine, Belorussia, Moldavia:			
Gor'kiy	21.7	18.4	16.9
Kharkov	19.3	23.8	20.6
Kiev	17.4	16.8	19.6
Kishinev	16.8	17.4	24.4
Kuybishev	26.6	28.9	29.6
Leningrad	19.8	18.0	17.8
Minsk	18.4	16.6	15.7
Moscow	20.4	21.2	22.9
Novosibirsk	25.2	23.9	22.0
Sverdlovsk	22.2	21.9	23.7
Baltic region:			
Riga	15.3	15.5	22.2
Tallin	18.2	14.9	19.5
Vilnius	14.4	13.6	17.0
Transcaucasian region:			
Baku	24.1	23.4	20.7
Tbilisi	21.3	26.3	33.9
Yerevan	26.8	28.4	21.4
Central Asian region:			
Alma-Ata	26.7	30.9	29.2
Ashkhabad	32.4	36.4	46.4
Dushanbe	46.7	47.7	51.8
Frunze	25.3	21.6	24.1
Tashkent	40.4	40.8	45.5

Note.—These rates were calculated by dividing the number of deaths at ages "younger than one year" by the number of births during the year.

Source: Column 1: Vestnik statistiki, No. 11, November 1971, p. 89. Column 2: Bednyy, "Current," 1976, p. 13. Column 3: Vestnik statistiki, No. 11, November 1975, p. 80.

As I have noted earlier, the crude death rates in the southern tier are much lower than those of the Slavic republics. However, when we look at one major component of the deaths in a given year, that of children aged 0–1 per 1000 live births, the inverse is true. Thus, as far as we can tell, the Muslim republics have infant mortality rates which are much higher than those of the Slavic republics. As I have stated also earlier in this paper, the Soviet Central Statistical Administration has failed to publish estimates for any year since 1974. And for some republics, especially those in which the rates are undoubtedly higher than the national average (see table 8), not for any year since 1967, and for Turkmenistan and Moldavia, not at all in the postwar period. However, from data on the capital cities of the republics (table 9), we can see that the disparities are enormous and the situation very worrisome for the public health authorities. Thus, in 1974, when the national rate was 27.9, Dushanbe, the capital of Tadzhikistan demonstrated the highest rate of all, a rate of 51.8 per 1000, and Minsk, the capital of Belorussia, the lowest at 15.8, less than one-third the rate recorded for Dushanbe. If the capital city of one of these Central Asian republics has such an incredible rate, what could it be in the rural areas where the rates must be distinctly higher? That all of these rates are higher now than in 1974 is predicated in part on the trend in the national crude death rates overall.

Table 10 provides a summary format of the balance of birth rates minus death rates for all the republics. The major differences in births results in significant gaps in net increases in the natural increase rates of each republic (the differences in infant mortality rates do not affect the total sufficiently to change the patterns emanating from the overall birth and death rates; nor does the emigration level of Jews, Germans, Armenians, and scattered others, except in a particular republic a bit more than others). Thus, the natural increase rate for Uzbekistan of 21.1 per 1000 population in the year 2000 is over 14 times as large as the 1.5 per 1000 projected for the RSFSR in the same year. While the base populations to which these rates apply are very different in size, the implications for the future beyond the year 2000 are fascinating to contemplate, especially the growth in the number of children below the age of 10 in the Muslim republics referred to earlier.

TABLES 10.—ESTIMATED AND PROJECTED NATURAL INCREASE, U.S.S.R. AND BY REPUBLIC: 1950 TO 2000

[Rates Per 1,000 population]

	1950	1960	1970	1980	1990	2000
U.S.S.R	17.0	17.8	9.2	9.4	7.1	5.5
R.S.F.S.R	16.8	15.8	5.9	6.1	2.7	1.5
Ukraine	14.3	13.9	6.3	4.9	2.6	1.5
Belorussia	17.5	17.8	8.6	8.4	6.3	3.8
Moldavia	27.7	22.9	12.0	11.7	7.9	5.4
Estonia	4.0	6.1	4.7	2.6	1.4	.9
Latvia	4.6	6.7	3.3	1.4	.5	−.1
Lithuania	11.6	14.7	8.7	6.3	5.8	3.7
Armenia	23.6	33.3	17.0	18.8	14.3	10.2
Azerbaydzhan	21.6	35.9	22.5	20.6	20.0	13.3
Georgia	15.9	18.2	11.9	11.0	8.9	6.3
Kazakhstan	25.9	30.6	17.4	17.6	14.2	10.0
Kirgiziya	23.9	30.8	23.1	23.6	21.0	16.3
Tadzhikistan	22.2	28.4	28.4	29.2	26.2	20.2
Turkmenistan	28.0	35.9	28.6	27.3	25.1	19.6
Uzbekistan	22.1	33.8	28.1	28.7	26.3	21.1

Source: Baldwin, Population, 1979, pp 13–14, 25–27.

Assuming the crude birth rate of the population of Muslim origin in Uzbekistan will go down more than estimated here, and that the crude birth rate will increase in the Russian Republic, then the differential in natural increase might be reduced to only 10 times—still a very large difference. However, the current base populations of 15 and 140 millions in Uzbekistan and the RSFSR, respectively, are very different also and it will take many years for the numbers to draw very close. However, as will be described below, many Muslims reside in the Russian Republic—in fact a remarkable number do so, and this is a fact which was not appreciated earlier.

Table 11 expands the fertility issue to some degree by use of data on average family size from the three postwar censuses. The average shown here for total populations, the urban and rural populations, are a measure of fertility trends throughout the period. While average family size may also reflect traditional differences regarding nuclear and extended families, the trends and gaps in size also must be based on differential patterns. The salient features of table 11 are the steady reduction of the average family size in the Slavic republics and the continual increase in three of the four Central Asian republics, and no reduction in the fourth (Kirgiziya) after an increase in the latter between 1959 and 1970. Thus, the difference between north and south becomes eminently clear, with the Slavic republics going down in average size from 3.6 in the Russian Republic to 3.3; in contrast, in Uzbekistan, the average moves from 4.6 to 5.3 to 5.5, and continues to increase.

TABLE 11. AVERAGE SIZE OF FAMILIES, U.S.S.R. AND BY REPUBLIC: 1959, 1970, AND 1979

U.S.S.R. and by republic	1959			1970			1979		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
U.S.S.R	3.7	3.5	3.9	3.7	3.5	4.0	3.5	3.3	3.8
R.S.F.S.R	3.6	3.5	3.8	3.5	3.4	3.8	3.3	3.2	3.4
Ukraine	3.5	3.4	3.7	3.4	3.3	3.6	3.3	3.2	3.3
Belorussia	3.7	3.5	3.8	3.6	3.5	3.7	3.3	(1)	(1)
Moldavia	3.8	3.5	3.9	3.8	3.4	3.9	3.4	3.2	3.6
Estonia	3.1	3.1	3.1	3.1	3.2	3.1	3.1	(3.1)	(3.1)
Latvia	3.2	3.1	3.2	3.2	3.2	3.2	3.10	3.08	3.13
Lithuania	3.6	3.4	3.7	3.4	3.4	3.5	3.3	3.3	3.3
Armenia	4.8	4.5	5.1	5.0	4.7	5.5	4.7	4.5	5.2
Azerbaydzhan	4.5	4.1	4.9	5.1	4.5	5.7	5.1	4.5	5.8
Georgia	4.0	3.7	4.2	4.1	3.8	4.3	4.0	3.9	4.2
Kazakhstan	4.1	3.9	4.3	4.3	3.9	4.8	4.1	(1)	(1)
Kirgiziya	4.2	3.9	4.4	4.6	4.0	5.1	4.6	3.8	5.3
Tadzhikistan	4.7	4.1	5.1	5.4	4.5	6.0	5.7	(1)	(1)
Turkmenistan	4.5	4.0	5.0	5.2	4.6	6.0	5.5	(1)	(1)
Uzbekistan	4.6	4.1	4.8	5.3	4.5	5.8	5.5	4.6	6.2

[1] Not available.

Source: As reported in 1959, 1970, and 1979 census data.

Table 12 provides further details on family size by concentrating on the share of large families by republic and by nationality. The latter nationality data come from both 1959, 1970 and 1979 censuses, but the data from 1959 are suspect because they are inconsistent with other information of fertility, especially for 4 republics (Azerbaydzhan, Kazakhstan, Kirgiziya, and Tadzhikistan). Again as in table 11, there has been the expected decline in the Slavic republics, and a surprisingly large increase in the 4 Central Asian republics. Moreover, when we utilize the data for nationalities in 1970, the proportions of families with 7 or more members turns out to be much smaller for Russians alone than for the RSFSR as a whole, whereas for the Central Asian families—as well as for the Kazakhs—the proportions of nationality families are at least 50 percent larger in 1970 and 33 percent larger in 1979 in all 5 republics in comparison to the republic as a whole. How much the republic and nationality shares represent traditional extended families as opposed to fertility alone is not clear, but the upward trends in these republics undoubtedly must be based on underlying fertility patterns which are remarkable for their persistence.

TABLE 12.—PERCENT OF FAMILIES WITH SEVEN OR MORE MEMBERS JOINTLY RESIDING TOGETHER, U.S.S.R. AND BY REPUBLIC: 1959, 1970, AND 1979

U.S.S.R. and by republic	By republic			By titular nationality		
	1959	1970	1979	1959	1970	1979
U.S.S.R.	5.7	5.8	4.9	5.7	5.8	4.9
R.S.F.S.R.	5.0	3.6	1.9	4.2	2.2	1.0
Ukraine	3.3	2.1	1.6	3.6	2.3	1.7
Belorussia	4.5	3.0	1.5	4.6	3.2	1.6
Moldavia	7.6	7.5	3.7	10.1	9.5	4.8
Estonia	1.4	1.0	.8	1.5	.9	.9
Latvia	1.8	1.2	.9	1.8	1.0	.9
Lithuania	4.3	2.5	1.6	4.5	2.6	1.6
Armenia	19.4	19.7	15.1	17.5	15.6	11.9
Azerbaydzhan	16.1	26.3	25.0	20.3	34.6	31.1
Georgia	8.4	7.6	7.6	8.5	6.4	6.7
Kazakhstan	9.9	13.4	11.7	15.8	32.5	32.3
Kirgiziya	10.6	19.4	20.2	14.9	33.8	35.7
Tadzhikistan	18.4	32.0	35.5	24.0	42.2	47.4
Turkmenistan	15.6	20.9	32.4	45.5	41.9	44.9
Uzbekistan	16.1	29.7	32.2	40.0	40.6	43.3

Source: 1959 and 1970: TsSU SSSR, Itogi Vsesoyuznoy perepisi naseleniya 1970 goda, vol. VII, Moscow, Statistika, 1974, pp. 234–237 and 272–273. The 1959 figures are based on a 5-percent sample, and are questionable in 4 republics—Azerbaydzhan, Kazakhstan, Kirgiziya, and Tadzhikistan. 1979: Vestnik statistiki, No. 12, December 1981, p. 57.

If the data in the preceding table is the case for the past, what of the future? Table 13 largely demonstrates expected differences by providing data on individual nationality expectations of fertility. These data came from a national survey of 347,314 women aged 18 to 59 conducted by the Central Statistical Administration of the USSR in 1972 among women aged 18 to 59. It shows that Slavic women expect to bear about one-third the number of children that the Central Asian women gave in their response. Expectations of giving birth to 6 or more children demonstrate the disparity even more, that is, 1 percent of Slavic women as contrasted to over 50 percent for the Central Asian women (excluding Kazakhs). Not all the infants born to these women will survive, due to the infant mortality phenomenon, and this may be a contributor to the natural compensation for the wastage based on high child mortality in these regions.

TABLE 13.—EXPECTED NUMBER OF CHILDREN, PERCENT DISTRIBUTION AND AVERAGE NUMBER, BY NATIONALITY AND BY SHARE OF MARRIED WOMEN: 1972

Nationality	All women	Share of married women (in percent)—number of children							Average expected number
		0	1	2	3	4	5	6 or more	
Russians	100	2.9	24.9	52.0	14.2	3.5	1.5	1.0	2.00
Ukrainians	100	2.8	18.4	56.0	16.8	3.9	1.3	.8	2.08
Belorussians	100	2.0	14.0	51.8	21.2	6.9	2.9	1.2	2.31
Moldavians	100	3.2	14.6	42.4	19.5	9.6	5.3	5.4	2.62
Estonians	100	2.6	18.3	51.5	18.8	5.3	2.5	1.0	2.18
Latvians	100	2.3	26.3	51.1	14.9	2.8	1.6	1.0	1.99
Lithuanians	100	2.1	20.1	48.7	18.3	6.5	2.5	1.8	2.23
Armenians	100	.6	4.2	24.0	28.3	24.8	10.2	7.9	3.42
Azeri	100	.7	3.3	12.2	15.0	18.3	14.5	36.0	4.89
Georgians	100	1.4	5.0	36.7	33.9	15.6	5.1	2.3	2.83
Kazakhs	100	1.4	2.9	13.3	14.9	14.3	15.6	37.6	5.01

TABLE 13.—EXPECTED NUMBER OF CHILDREN, PERCENT DISTRIBUTION AND AVERAGE NUMBER, BY NATIONALITY AND BY SHARE OF MARRIED WOMEN: 1972—Continued

Nationality	All women	Share of married women (in percent)—number of children							Average expected number
		0	1	2	3	4	5	6 or more	
Kirgiz	100	.4	1.1	5.4	9.6	14.2	17.0	52.3	6.04
Tadzhiks	100	1.5	1.1	6.3	8.0	14.4	15.3	53.4	5.97
Turkmen	100	2.3	3.3	5.1	8.1	11.5	15.7	54.0	5.93
Uzbeks	100	1.2	1.5	5.4	7.1	13.0	13.0	58.8	6.26

Note.—Based on a survey of 347,314 women, aged 18–59 years.

Source: V.A. Belova et al., Skol'ko detey budet v sovetskoy sem'ye, Moscow, Statistika, 1977, p. 26.

One technique the Soviet central authorities have applied in their attempt to resolve the demographic problem of differential growth rates, in addition to relieving labor deficit regions of their persistent shortages is to encourage Muslim migration to other regions of the country. If they were to move, these Muslins might adopt local customs, intermarry, and therefore have a different, i.e., lower fertility behavior. In other words, before they become "Sovietized" they must move out of the South. However, as table 14 shows, they are just not moving at all out of the region. In 1979, out of the national total of 12,456,000 Uzbeks, there were only 91,000 Uzbeks residing outside Central Asia and Kazakhstan; this small number represents only seven tenths of one percent of the total number of Uzbeks in the country. Over the entire two decades, 1959 to 1979, there were only 49,000 more Uzbeks outside the region than at the beginning of the period; assuming for the moment, as unrealistic as is the proposition, that none of this increment of 49,000 was due to births among those living outside the area during the entire 20 years. Instead, assume that all of this increment related only to outmigrants from the south. The resulting average of 2,450 Uzbek migrants per year is miniscule in the extreme especially when considering that the entire Uzbek population grew by over 320,000 per year over the same period.

TABLE 14.—NUMBER AND DISTRIBUTION OF THE CENTRAL ASIANS AND KAZAKHS IN THEIR TITULAR REPUBLICS, BY NATIONALITY AND BY REPUBLIC: 1959, 1970, AND 1979

[In thousands]

Nationality—Republic	1959					1970					1979				
	Kazakhs	Kirgiz	Tadzhiks	Turkmen	Uzbeks	Kazakhs	Kirgiz	Tadzhiks	Turkmen	Uzbeks	Kazakhs	Kirgiz	Tadzhiks	Turkmen	Uzbeks
Total in U.S.S.R.	3,622	969	1,397	1,002	6,015	5,299	1,452	2,136	1,525	9,195	6,556	1,906	2,898	2,028	12,456
Number outside Central Asia and Kazakhstan[1]	389	1	6	12	42	490	11	18	23	76	530	20	23	27	91
Total in five republics	3,233	963	1,385	986	5,973	4,809	1,441	2,118	1,502	9,119	6,026	1,886	2,875	2,001	12,365
Kazakhstan	2,787	7	8	[2]	137	4,234	10	16	3	216	5,289	9	19	2	263
Kirgiziya	20	924	15	[2]	219	22	1,285	22	[2]	333	27	1,687	23	1	426
Tadzhikistan	13	26	1,051	7	454	8	35	1,630	11	666	10	48	2,237	14	873
Turkmenistan	70	[2]	[2]	924	125	69	[2]	1	1417	179	80	[2]	1	1,892	234
Uzbekistan	343	93	311	55	5,038	476	111	449	71	7,725	620	142	595	92	10,569
Percent of U.S.S.R. total	89.3	99.4	99.1	98.4	99.3	90.7	99.2	99.2	98.5	99.2	91.9	99.0	99.2	98.7	99.3

[1] See Text regarding Kazakhs in R.S.F.S.R.
[2] Not reported or less than 500.

Source: Published census results.

The table also shows a reduction in the proportion resident in the region of the 5 nationalities, the Kirgiz, and it dropped by only 0.4 percentage point of the 99.4 percent resident during 1959 to 1979. The corresponding proportion for the others either remained at the same level or grew.

A large number of Kazakhs reside outside the boundaries of the 5 republics, but the impact of this seemingly large number is much reduced if we include the population residing in the five oblasts of the RSFSR contiguous to Kazakhstan—the Astrakhanskaya, Omskaya, Orenburgskaya, Saratovskaya, and Volgogradskaya Oblasts—part of the traditional Kazakh pasturelands of the Southern Steppe. In 1970, 69.4 percent of the 477,800 Kazakhs in the RSFSR lived in these five oblasts, and in 1979, they were 70.4 percent of the 518,060. If we add these areas to Central Asia and Kazakhstan, the proportion of Soviet Muslims in the region rises to 98.5 percent in 1970 (compared with 97.3 percent). These data confirm the reluctance of Soviet Muslims to move away from their traditional homelands, despite the fact that the Government and Party has tried to encourage laborers to leave the region.

The small changes in the rural populations in each of the republics according to the 1959 and 1970 censuses also shows the reluctance of Soviet Muslims of Central Asia and Kazakhstan to move to cities (table 15). This reluctance is partly due to the predominance of Russians in many cities as well as the Muslims' large family size which retards movement to crowded cities in their own area, let alone to those in cold northern areas. Economic problems such as lack of housing and consumer goods also deter these Muslims from moving to labor deficit areas in Siberia and the Far East.

TABLE 15.—RURAL POPULATION AS A PERCENT OF TOTAL POPULATION AND TOTAL NATIONALITY, BY REPUBLIC AND BY NATIONALITY: 1959, 1970, AND 1979

Republic	Nationality	Total republic population			Nationality population			Nationality within titular republic	
		1959 (1)	1970 (2)	1979 (3)	1959 (4)	1970 (5)	1979 (6)	1959 (7)	1970 (8)
U.S.S.R		52.1	43.7	37.7	52.1	43.7	37.7	([1])	([1])
R.S.F.S.R	Russians	47.6	37.7	30.7	42.3	32.0	25.6	45.1	34.4
Ukraine	Ukrainians	54.3	45.5	38.7	60.8	51.5	44.4	63.4	54.2
Belorussia	Belorussians	69.2	56.6	44.9	67.6	56.3	45.3	74.5	62.9
Moldavia	Moldavians	77.7	68.3	60.7	87.1	79.6	73.2	90.4	82.8
Baltic Republics	Baltic nationalities	51.7	42.6	34.9	58.7	49.9	(NA)	59.7	50.8
Estonia	Estonians	43.5	35.0	30.3	52.9	44.9	40.9	53.1	45.3
Latvia	Latvians	43.9	37.5	31.5	52.5	47.3	42.0	53.3	48.3
Lithuania	Lithuanians	61.4	49.8	39.3	64.9	53.3	46.7	66.4	54.1
Transcaucasian republics.	Transcaucasians	54.1	48.9	44.6	57.6	51.1	(NA)	60.5	53.0
Armenia	Armenians	50.0	40.5	34.2	43.4	35.2	30.3	47.8	37.7
Azerbaydzhan	Azeri	52.2	49.9	46.9	65.2	60.3	55.5	63.7	58.7
Georgia	Georgians	57.6	52.2	48.1	63.9	56.0	50.9	65.1	57.2
Kazakhstan	Kazakhs	56.2	49.7	46.1	75.9	73.3	68.4	75.7	73.7
Central Asia	Central Asians	65.1	61.9	59.3	79.1	75.3	(NA)	80.2	76.5
Kirgiziya	Kirgiz	66.3	62.6	61.3	89.2	85.4	80.4	89.0	85.5
Tadzhikistan	Tadzhiks	67.4	62.9	65.1	79.4	74.0	71.9	80.4	74.5
Turkmenia	Turkmen	53.8	52.1	52.0	74.6	69.0	67.7	73.7	68.3
Uzbekistan	Uzbeks	66.4	63.4	58.8	78.2	75.1	70.8	79.8	77.0

[1] Not applicable.

Source: Murray Feshbach and Stephen Rapawy, "Soviet Population and Manpower Trends and Policies," in U.S. Congress, Joint Economic Committee, Soviet Economy in a New Perspective, Washington, D.C., 1976, p. 127, and V.I. Kozlov, Natsional'nosti SSSR, Moscow, 1982. pp. 80 and 100.

The rural share of the titular nationalities within their own republics dropped very little between 1959 and 1970; that of the Kazakhs and Uzbeks dropped by less than 3 percentage points, the Kirgiz by 3.5 points, and the Tadzhiks and Turkmen by 5 to 6 points. Given indications of little migration to cities in the intercensal period between 1970 and 1979 and the number of births in rural areas according to the early 1979 census results, I do not expect a large change in this picture between 1970 and 1979 when the 1979 census data are released in fuller form. New information shows this to be correct for the country as a whole.

Information on the share of the urban population by republic given in table 16 shows a similar north/south dichotomy. In contrast to the increase of 14 to 17 percentage points in the urban shares of the USSR and RSFSR populations, respectively, the average increase among the Central Asian republics and Kazakhstan was 5.4 percentage points over the same 20 year period. In Tadzhikistan the urban share of the population actually decreased during the last intercensal period due to the continuation of high fertility and little migration to the cities.

TABLE 16.—SHARE OF URBAN POPULATION, U.S.S.R. AND BY SELECTED REPUBLIC: 1959, 1970, AND 1979

U.S.S.R. and selected republics	1959	1970	1979
U.S.S.R.	48	56	62
R.S.F.S.R.	52	62	69
Kazakhstan	44	51	54
Kirgiziya	34	37	39
Tadzhikistan	33	37	35
Turkmenistan	46	48	48
Uzbekistan	33	36	41

In this projection prepared in the spring of 1977, it is apparent that a relative shift of the population will occur toward the south of the USSR—again assuming no massive shifts of the population through voluntary migration. Thus, the Slavic republics are expected to decline from 82 percent in 1950 to 69 percent of the total population of the USSR at the end of the century (Table 17). Simultaneously, the southern republics of the Transcaucasus, Kazakhstan, and Central Asia are expected to increase from 14 percent to 27 percent in 1950 and 2000, respectively.

TABLE 17.—ESTIMATED AND PROJECTED PERCENTAGE DISTRIBUTION OF THE SOVIET POPULATION BY REGION: 1950 TO 2000

Regions and republics	1950	1960	1970	1980	1990	2000
U.S.S.R.	100.0	100.0	100.0	100.0	100.0	100.0
Slavic	81.6	79.9	77.0	74.8	71.7	68.9
R.S.F.S.R.	56.8	56.1	53.8	52.3	50.1	48.0
Ukraine	20.5	20.0	19.5	18.9	18.0	19.3
Belorussia	4.3	3.8	3.7	3.6	3.6	3.6

TABLE 17.—ESTIMATED AND PROJECTED PERCENTAGE DISTRIBUTION OF THE SOVIET POPULATION BY REGION: 1950 TO 2000—Continued

Regions and republics	1950	1960	1970	1980	1990	2000
Moldavia	1.3	1.4	1.5	1.5	1.5	1.6
Baltic	3.1	2.9	2.9	2.8	2.6	2.5
Transcaucasus	4.3	4.6	5.1	5.4	5.9	6.3
Central Asia and Kazakhstan	9.6	11.3	13.6	15.5	18.2	20.8
Kazakhstan	3.7	4.6	5.4	5.6	6.3	6.7
Central Asia	5.9	6.7	8.2	9.9	11.9	14.1

Source: Baldwin, Projections, 1979, p. 11, expect for 1980, which is from TsSU, SSSR v tsifrakh v 1979 godu, Kratkiy statisticheskiy sbornik, Moscow, Statistika, 1980, pp. 10–11.

Table 18 projects the population of Muslim origin until the year 2000. It provides ample evidence of their rapid growth. The table is based on a detailed tabulation of all Muslim nationalities residing in each of the designated regions or republics. Thus, while the 10 million or so persons of Muslim origin in the RSFSR represent a declining share of all Muslims due to the continuing drop in fertility among the Tatars, the RSFSR in 1979 represents (an astonishing) one-quarter of the total number of all Muslims in the U.S.S.R.

TABLE 18.—POPULATION OF MUSLIM ORIGIN, U.S.S.R. AND BY REPUBLIC: 1959, 1970, 1979, AND 2000

U.S.S.R. and republic	1959		1970		1979		2000			
							A.		B.	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
U.S.S.R	24,738,462	100.0	35,158,288	100.0	43,772,000	100.0	74,562,000	100.0	63,880,000	100.0
Central Asia and Kazakhstan	13,768,661	55.7	20,737,635	59.0	27,156,000	62.0	51,203,000	68.7	42,232,000	66.1
Kazakhstan	3,261,379	13.2	5,005,391	14.2	6,196,000	14.2	10,194,000	13.7	8,974,000	14.0
Kirgiziya	1,189,676	4.8	1,802,827	5.1	2,270,000	5.2	3,886,000	5.2	3,360,000	5.3
Tadzhikistan	1,616,177	6.5	2,432,677	6.9	3,279,000	7.5	6,581,000	8.9	5,254,000	8.2
Turkmenistan	1,173,758	4.7	1,752,969	5.0	2,300,000	5.3	4,335,000	5.8	3,676,000	5.8
Uzbekistan	6,527,671	26.4	9,743,771	27.7	13,111,000	30.0	26,107,000	35.1	20,968,000	32.8
Azerbaydzhan	2,654,863	10.7	4,004,146	11.4	4,968,000	11.3	8,218,000	11.0	7,217,000	11.3
R.S.F.S.R	7,258,085	29.3	9,395,609	26.7	10,438,000	23.8	13,342,000	17.9	12,870,000	20.1
Other republics	1,056,853	4.3	1,020,898	2.9	1,210,000	2.8	1,799,000	2.4	1,671,000	2.6

Sources: 1959, 1970, and 1979: Published census results by republic and by nationality within each republic. 2000: A. Extrapolated on the basis of 1970 to 1979 trends of annual average rate of increase. B. Extrapolated on the basis of 1970 to 1979 trends of annual average absolute increase.

In order to project the Muslim population until the year 2000, two separate projections were made, the first based on the rate of increase, the second, on the absolute increase during the last intercensal period to 1970 to 1979. The entire period of 1959 to 1979 was not used because there has been a distinct slowdown in the overall rate of increase as well as in the relative increments for individual nationalities comprising the separate regions and republics. Thus, based on projection A, the result in the year 2000 would be an undoubtedly too high figure of 75 million persons, or one out of every 4 Soviet citizens. While many in the West, including myself had projected such a high figure in the past based on the 1959 to 1970 trend, based on present evidence this number undoubtedly will not be reached. Moreover, the figure of 75 and others up to 100 million were based on higher projections of the total population. For example, until quite recently even the Central Statistical Administration of the USSR was projecting a figure of 340–350 million for the year 2000. Projections by the Foreign Demographic Analysis Division of the US Census Bureau made subsequent to the data of the Soviet figure were of 312 and 309, depending on the date of the projection, both of which are higher than the current expectation of 300 million persons for the entire Soviet Union.

On the basis of the alternative projection which uses the annual average absolute increase in each administrative unit, the total number of people of Muslim origin by the end of the century is a seemingly more reasonable figure of 64 million persons. The regional distribution of Muslims themselves changes slightly with somewhat less emphasis accorded to the Muslims residing in Central Asia and Kazakhstan, and more in the RSFSR. Regardless of the precise distribution within the total, the total number of all persons of Muslim origin represents somewhat over 1 of every 5 Soviet citizens projected for the end of the century. This figure for the year 2000 is a significant increase from 1 of every 7 in 1970 and underlies much of the political, migration, investment, language and other issues being addressed in the USSR and discussed in the West.

Table 19 consolidates the calculations of the growth of Muslims with those for the total USSR, Slavic (Russians, Ukrainians, and Belorussians), and Russian populations. The figures for 1970 and 1979 are reported, or are based on reported figures, whereas those for the total population, the Slavs, and the figure for Russians in the year 2000 are based on the information furnished by the first Soviet scholar to publish absolute estimates for the Soviet population by nationality at the end of the century. (The Bondarskaya graphic presentation in her book on Fertility in the USSR was useful as indicating Soviet interest in this issue, but explicity incorporated some unrealistic assumptions.) The Russian figure in table 19 is derived from a percent relationship with the total population. The figures for the Muslims are from table 18.

TABLES 19.—NUMBER AND GROWTH OF TOTAL, SLAVIC, RUSSIAN, AND MUSLIM POPULATIONS OF THE U.S.S.R.: 1970 TO 2000

[In millions and in percents]

Population group	Year			Absolute growth		Average annual rate of increase	
	1970	1979	2000	1970–2000	1979–2000	1970–2000	1979–2000
Total population of which	242	262	300	58	38	0.72	0.65
Slavic	179	189	195	16	6	.29	.15
Of which, Russians	129	137	140	11	3	.27	.10
Muslims	35	44	A.75	40	31	2.57	2.57
			B.64	29	20	2.03	1.80

Sources: 1970 and 1979: Based on published census results and table 18. 2000: Based on M. B. Tatimov, Razvitiye narodonaseleniya i demograficheskaya politika, Alma-Ata, "Nauka" Kazakhskoy SSR, 1978, pp. 120–121, and table 18.

We can readily see the slowdown in the total population, the Slavic and Russian growth in absolute and in relative terms; the Russians growing according to this information by only one-tenth of 1 percent per year in the period 1979–2000! In contrast, the Muslims will grow by 2.57 percent or 1.80 percent per year depending on the assumption adopted, or a growth of 3 million Russians and 31 or 20 million Muslims, in absolute terms. In the former case, it is striking that the estimate shown in table 18 for Central Asia and Kazakhstan using the annual average rate of increase is equal to that projected by Tatimov, the Kazakh demographer who published the nationality figures cited above. Even if we were to assume the lower figures resulting from the use of absolute average number of additions per year (as shown to be preferable earlier), the rates of increase are still many, many times higher than that for the Slavs, or Russians alone.

The implications of all of the above for the Soviet central authorities relate to changing shares, the reduction in the number of children at young ages, labor force distributions, and so forth. Thus, it is no wonder that Brezhnev referred to the need for an "effective demographic policy" which he did not spell out at the time of the 1976 XXVth Party Congress. Undoubtedly, it related to increasing the birth rate among the Slavs, reducing mortality, encouraging migration, enhancing the prestige of the family, improving the Russian-language ability of the Muslim population, and so forth.

The 1980 release of the "Basic Directions" of the Eleventh Five Year Plan confirm that the concern is growing among the leadership. To wit, they now specify that the population policy of the Soviet Government includes issues related to family formation, maternity and labor force participation of women, child care and invalid maintenance, life expectancy, and health status of the population. (Trud, December 2, 1980, p. 2.) However, how to carry out these policies, and whether to administer them uniformly or on a regional basis remained open to dispute in the Soviet Union. How to encourage fertility in the Slavic republic without simultaneously expanding the fertility of Muslim women is but one issue in this dispute, among others, between Urlanis and Litvinova, on one hand, and Manevich and Tatimov, on the other. Tatimov has written that any differentiated policy would in fact be a "discriminatory policy" and that the Muslims would therefore be treated as less than equal. It remains to be seen how this and other matters seen by the Russians as a demographic threat from within will be treated. (A choice seems to have been made since the time of the Conference. The Twenty-Sixth Party Congress held in February-March 1981, subsequent to the date of this Conference, revealed that the leadership had opted to differentiate between republics and regions. Some of the details of their definition of a demographic policy were elaborated at the Congress itself and in the implementing legislation thereafter. The legislation, in particular, confirmed the leadership's concern about the population problems and especially its regional dimensions.)

THE SOVIET LABOR MARKET IN THE 1980's

By Ann Goodman and Geoffrey Schleifer

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SUMMARY

The Soviet labor market will undergo a radical change in the 1980s. Constrained since the early 1960s by sluggish technological progress, the U.S.S.R. has relied more heavily than Western industrialized nations on increases in the size of the labor force to spur economic development. During the next decade this will no longer be possible.

Growth of both the working-age population and the labor force will decelerate sharply during 1981–90. The slowdown will be less pronounced for the labor force, however, because of changes in the age-sex structure of the general population and a rising participation rate for pensioners. There will be a greater concentration of workers in their 30s and 40s (the age group with the highest labor-force participation rates) and an increasing portion of males. The retirement-age population will increase rapidly, and the recently revised pension laws will encourage the older people to continue working.

Despite these structural changes, labor force growth in the 1980s still will be less than half of what it was in the 1970s.

[In thousands of persons]

	1971		1981		1991
Total working-age population	132,794		156,087		161,034
Net 10-year increment		23,294		4,947	
Average annual rate of growth (percent)		1.6		0.3	
Total labor force	126,656		146,569		155,821
Net 10-year increment		19,913		9,252	
Average annual rate of growth (percent)		1.5		0.6	

To compensate for this slowdown, Moscow is becoming more directly involved in allocating scarce labor resources and tightening worker discipline in an effort to assure that priority sectors have adequate manpower and to increase labor productivity. During the past few years, it has:

Centralized decisionmaking regarding labor issues under the State Committee for Labor and Social Questions (Goskomtrud);

Become more active in steering workers into particular industries; and

Called for tougher action against people who come to work drunk, are illegally absent, or avoid employment.

These actions are unlikely to increase productivity much, so the Soviets are also considering a number of long-term policies to ease their labor difficulties. The most promising is the effort to mechanize and automate labor-intensive industrial processes; this will require massive investment in modern machinery. Another proposal involves the shift of investment spending into labor surplus areas like Central Asia to promote development where the labor is in abundant supply. These schemes can only be implemented slowly, however, because of the slowdown in overall investment growth and the competition for new investment rubles. A third policy—to increase the birth rate—will not speed up labor force growth until after the year 2000.

THE TWOFOLD PROBLEM

The Soviet economy, constrained for many years—but especially recently—by sluggish productivity growth, now must cope with a second problem—a sharp slowdown in annual increments to the population of working age. The prospect of a labor shortage is especially painful for Soviet planners, because up to now the share of labor's contribution to growth generally has been larger than in other developed economies, while the contribution of productivity has been smaller. Moscow counts on turning this situation around in the 1980s, relying more on productivity and less on numbers to spur economic growth.

This report describes the nature and magnitude of the impending labor shortage and assesses Moscow's efforts to limit its impact. It then evaluates the consequences for economic growth in the 1980s. Appendix A contains a list of major decrees the Soviet government has issued since 1975 on the allocation, training, and use of manpower. This study does not address the question of possible changes in the demand for labor during the 1980s, some aspects of the demand for labor are addressed in a separate article in this volume by Gertrude Schroeder Greenslade.

THE COMING LABOR SHORTAGE

Decline in working-age population growth

The Soviet labor market will undergo a fundamental change in the 1980s.[1] After increasing by an average of 2.3 million persons per year during 1971–80, the working-age population [2] will increase much more slowly in the first half of this decade, adding less than 300,000 persons in 1986. The annual net increment will rise slightly thereafter, but at decade's end will still be extremely small. Thus, during the 11th (1981–85) and 12th (1986–90) Five-Year Plan Periods (FYPs) the national manpower pool will increase only one-quarter as much as it did during the 10th (1976–80) FYP. (Figure 1 shows this trend).

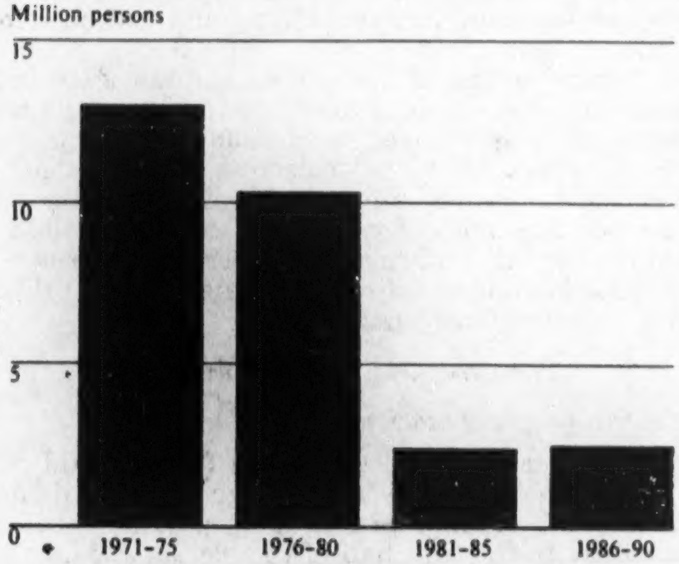
---

[1] The data on population, and labor-force size used in this paper were derived primarily from unpublished estimates prepared by the Foreign Demographic Analysis Division, US Bureau of the Census, US Department of Commerce, May 1980; Stephen Rapawy, Estimates and Projections of the Labor Force and Civilian Employment in the USSR, 1950 to 1990, Foreign Economic Report No. 10, September 1976, US Department of Commerce; and various issues of the USSR's annual statistical handbook Narodnoye khozyaystvo SSSR.

These data have been supplemented where possible with information from the USSR's January 1979 All-Union Census. Only limited information from the census has been released so far, however, and data useful in labor force analysis are noticeably scarce. Although final census results are still to be published, the Soviet have not announced officially (as they did with previous censuses) the publication format or what data will be released. According to one source, however, they intend to publish only two volumes of census data (seven volumes were released for the 1970 census).

[2] The Soviets define the "working-age" or "able-bodied population" as males between 16 and 59 and females between 16 and 54. They define the labor force as all those who claim an occupation at the time of the census, regardless of age or how long they have been working. It excludes partially employed pensioners, full-time students, and poeple engaged in the private subsidiary economy.

Figure 1
Increase in Size of the Soviet Working-Age Population[a]



[a] Males 16-59 and females 16-54.

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Two developments will contribute almost equally to this precipitous drop: fewer children are reaching working age and more adults are reaching retirement age (figure 2). The young group reflects the sharp fall in birth rates since the early 1960s, and the older group reflects the high birthrates during the 1920s and 1930s.[3] Another factor reducing the size of the working-age population is the rising mortality rate among males age 25-44 due to increasing incidence of alcoholism, industrial accidents, and cardiovascular disease.[4]

---

[3] The new workers of the 1980s—those who will turn 16 years old during the decade—were born between 1964 and 1973, when the birth rate was at its lowest point. This small cohort will be replacing older workers—women reaching age 55 and men reaching age 60—who were born when birth rates were much higher. Available data indicate that in the mid-1960s the national birth rate (expressed as live births per 1,000 population) was about 42 percent of that of the mid-1920s and in the early 1970s it was 40 percent.

[4] Between 1964 and 1974, for example, the mortality rate among men between 35 and 39 increased by 20 percent. The Soviets no longer publish such data, but Western researchers believe the rising trend is continuing. See Christopher Davis and Murray Feshbach, "Life Expectancy in the Soviet Union," Wall Street Journal, 20 June 1978 and Naseleniye SSSR 1973, Statisticheskiy sbornik, Moscow, 1974.

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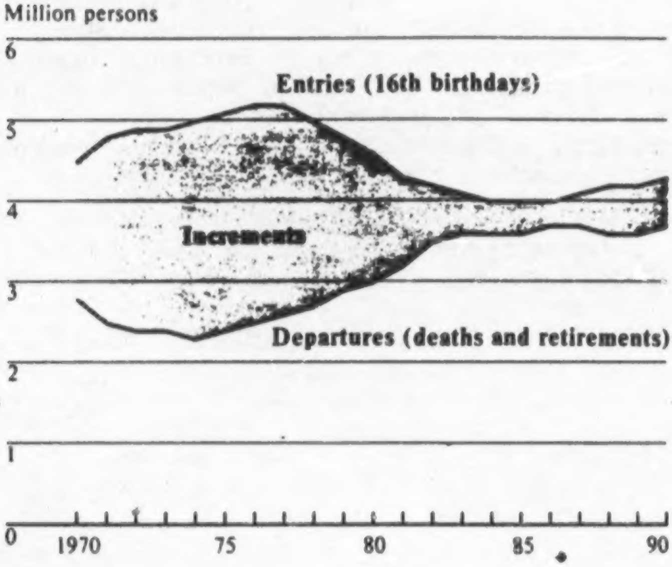
Figure 2
Increments to the Soviet Working-Age Population[a]



[a]Males 16-59 and females 16-54.

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Changes in the age composition of the labor force

To a limited degree, changes in the age structure of the labor force will offset some of the sharp drop in the growth of the working-age population. People in their 30s and 40s are more likely to be in the work force than people in their 20s and 50s; and during 1981-90 the share of the population aged 30-49 will increase by 4 percentage points to 47 percent. Because this age cohort averages a higher labor-force participation rate than other able-bodied groups, this demographic change will spur labor force growth.

At the same time, Moscow will be able to tap the growing pension-age population for extra workers. During the 1980s, 9.5 million people will reach pension age—more than twice the level of the 1970s. Consequently, if past participation rates hold, the share of the pension-age population in the labor force will increase from about 10 percent to 12 percent. The net result of these two factors—a higher concentration of workers in their 30s and 40s and a larger share of pensioners—will be a less precipitous decline in growth of the labor force than in the growth of working-age population during the 1980s.

Efforts to increase labor force participation rates

Just how fast the labor force grows in the 1980's, however, will depend mainly on Moscow's success in raising labor-force participa-

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tion rates. They are already higher in the U.S.S.R. than in any other industrialized country in the world. (Currently, over 90 percent of the able-bodied Soviet citizens work or go to school.) Nevertheless, the leaders over the past several years have taken various steps to increase participation rates. They have:

Revised pension laws to make it more profitable for pensioners to continue working beyond retirement age;

Expanded child-care services to promote work among women with small children; and

Emphasized part-time schooling to increase employment among the school-age population.

These efforts are expected to have only a limited impact, however. Table 1 shows our projections of LFPR, labor force growth, and the methodology used to derive these estimates.

TABLE 1.—GROWTH OF THE SOVIET LABOR FORCE AND POPULATION AGE 16 YEARS AND OVER

[Thousand persons as of January 1]

U.S.S.R.	1971			1981			1991		
	Population [1]	LFPR [2]	Labor force [3]	Population [1]	LFPR [4]	Labor force [3]	Population [1]	LFPR [4]	Labor force [3]
AGE AND SEX	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Male total 16 years and over	74,807	....	61,909	89,527	....	73,930	97,495	....	80,394
16 to 19 years	9,066	53.3	4,832	9,711	48.4	4,700	8,603	43.9	3,777
20 to 29 years	15,605	89.7	13,998	24,017	89.5	21,495	21,617	89.5	19,347
30 to 39 years	18,605	97.6	18,158	15,016	97.6	14,656	23,022	97.6	22,469
40 to 49 years	14,526	95.9	13,930	17,407	95.9	16,693	14,006	95.9	13,432
50 to 54 years	3,370	90.0	3,033	8,275	90.0	7,448	9,016	90.0	8,114
55 to 59 years	4,134	79.9	3,303	4,640	79.9	3,707	6,343	79.9	5,068
60 years and over	9,501	49.0	4,655	10,461	50.0	5,231	14,888	55.0	8,188
Female total 16 years and over	94,988	....	64,747	108,112	....	72,639	114,580	....	75,427
16 to 19 years	8,697	47.8	4,157	9,390	40.8	3,831	8,371	35.0	2,930
20 to 29 years	15,501	86.3	13,377	23,451	86.1	20,191	21,299	84.1	17,912
30 to 39 years	19,240	92.7	17,835	15,368	92.7	14,246	23,221	90.7	21,061
40 to 49 years	18,470	90.6	16,734	18,882	90.6	17,107	15,072	90.6	13,655
50 to 54 years	5,580	77.3	4,313	9,930	77.3	7,676	10,464	77.3	8,089
55 to 59 years	7,505	44.4	3,332	7,754	45.4	3,520	7,610	47.9	3,645
60 years and over	19,995	25.0	4,999	23,337	26.0	6,068	28,543	28.5	8,135

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[1] The population figures in columns 1, 4, and 7 are estimates prepared by the Foreign Demographic Analysis Division, U.S. Bureau of the Census, in May 1980. They are based on the age-sex distributions reported in the 1970 Soviet census and the official Soviet figures for total population, births, and deaths for the years 1970–75.

[2] To derive the labor force participation rates (LFPRs) in column 2, the 1970 census figures on labor force by age and sex (reported in Vestnik statistiki, No. 12, 1974, p. 90) were divided by the corresponding population groups estimated by the U.S. Census Bureau.

We have had to adjust the participation rates of the pension-age population substantially, however, because the census data include only a small portion of the working pensioners. Soviet census methodology includes in the labor force those who are working on a "permanent" job basis "at the time of the census" and excludes those in temporary or part-time jobs. Because much of agricultural employment is seasonal, pensioners may work for limited periods; thus they can be included in the average annual employment figure in proportion to the time worked but be excluded from the census data on the labor force.

To make our estimates of the labor force approximate the actual total labor input of the U.S.S.R., we added an allowance for pensioners, making the size of the labor force comparable to the Soviets' reported average annual employment. Rates were adjusted upward by 29 percentage points for males and 18 percentage points for females over those implied by the official data.

[3] We derived the labor force figures in columns 3, 6, and 9 by multiplying the U.S. Census Bureau's population figures by the appropriate participation rate.

[4] To derive the LFPRs shown in columns 5 and 8:

16–19 years: Participation rates between 1970 and 1980 and 1980 and 1990 were decreased annually at one-third the annual rate of decrease between 1959 and 1970 to reflect the continued trend toward extending the length of compulsory education.

20–29 years: Participation rates between 1970 and 1980 were decreased by 0.2 percentage points to allow for the delay in entering labor force caused by continued schooling. The 1980 rate was then held constant for males and decreased by 2 percentage points for females age 20–39 to reflect the increased share of females from Central Asia in this age category.

30–54 years: The 1970 rates were held constant except for females age 30–39 discussed above.

55–59 years: The 1970 rates were held constant for males and increased by 1 percentage point for females in 1980 and 2.5 percentage points in 1990. Women will be encouraged to remain in the labor force longer because of the slow growth in the supply of manpower.

60 years and over: The 1970 rates were increased by 1 percentage point for 1980. The rates were increased by 5 percentage points for males and 2.5 percentage points for females in 1990.

Pensioners

According to the pension laws as revised on 1 January 1980, payments will be increased by 10 rubles per month for each year of work beyond retirement age.[5] (This increase is limited to four years, however—a maximum increase of 40 rubles per month.) Depending on the type of job, pensioners also will be allowed to retain all or part of their pension income as well as receiving wages.

Another factor that will tend to increase the pensioners' LFPR is their changing age structure. Of the 9.5 million person increment to the retirement-age population in the 1980s, nearly half will be males between 60 and 64 years compared with one-quarter during the 1970s. The Soviets have not published a breakdown by age of LFPR for retirees in the last two censuses, but this age-group apparently has the highest LFPR among pensioners. According to one survey, the LFPR for highly skilled scientific workers and medical personnel between 60 and 64 averaged almost 70 percent, and another source indicated that for all workers and employees the figure was 60 percent.

Taking into account both the changing age structure and the added incentive to continue working, we estimate that the LFPR for males will increase by 5 percentage points and for females by 2.5 percentage points from their current rate. Such a change would add more than 1.6 million persons to the labor force during the 1980's.

Women

Since 1978, the Council of Ministers has issued a number of decrees to try to raise female employment. These call for greater use of part-time employment, more on-the-job training for women with young children, and the provision of more household goods and services to make it easier for such women to work. Nevertheless, we expect female participation rates to decline slightly during the 1980s, for two reasons. First, nearly 90 percent of Soviet women are already working or studying full time—a rate that can hardly increase much. And second, most of the additional female labor supply will come from Central Asia and Kazakhstan—in fact, over two-fifths of the entire increment to the total Soviet able-bodied population (roughly 2 million of the 5 million) will be females from this region in the high fertility ages 20-39. These women historically have had participation rates lower than the national average, and Moscow probably cannot make much change in that pattern during the 1980s.

---

[5] By international standards, the eligibility ages for retirement in the USSR (60 years for men and 55 years for women) are extremely low. Pensions are also very low, however; the minimum legal pension was raised to 50 rubles per month for industrial workers (less than one-third the monthly industrial wage) and 40 rubles per month for collective farmers in March 1981. As a result, about 70 percent of pension-age workers continue working for the first five years beyond retirement age.

Nonetheless, for the 1980s we expect only a relatively small decline in participation rates among females in their 20s and 30s. The share for females age 20-39 from Central Asia and Kazakhstan looms large in the 10-year increment, but they will still comprise less than 20 percent of all Soviet females of that age group in 1990. Moreover, two factors suggest that the LFPR among Central Asia and Kazakhstan women age 20-39 might increase:

The Soviet government is trying to increase female employment and educational attainment in general; and

There is some evidence of declining fertility among these women—and thus more likelihood of their working outside the home.

Even so, their LFPR will probably remain far below the national average.

As a result, we have decreased the LFPR for all females age 20-39 by 2 percentage points during 1981-90, which means roughly 900,000 fewer females in this age group will enter the labor force than the previous pattern would suggest.

Teenagers

Some government officials have suggested that to increase employment among the school-age population would alleviate the labor shortage. However, Soviet educational policies in the past decade have taken the opposite direction—extending the length of compulsory education and providing for expanded vocational-technical training.[6] According to Soviet estimates, those who entered the labor force in the late 1970s were 19 or 20 years old—two to three years older than those who entered in the late 1960s. Because we expect this trend to continue, we estimate that participation rates among the schoolage population (16-19 years) will decrease by about 5 percentage points over the next decade. The leadership apparently believes that the additional training will raise the productivity of workers enough to justify their delay in entering the labor market.

Other sources of labor

Besides trying to increase participation rates, Moscow could draw from foreign labor and from the military. Neither source would be very helpful.

Currently the USSR has about 90,000 foreign workers, primarily from Eastern Europe. For the most part, they are employed on joint projects—for example, the Orenburg gas pipeline completed in 1978. Such cooperation is likely to continue, but not increase. Recent reports indicate that Vietnam is sending laborers to the Soviet Union. Estimates of the number of workers vary, reaching as high as 500,000 during 1981-85. These workers are primarily unskilled laborers. In short, foreign workers will probably continue to be used in a limited way during the 11th FYP. As in the past, they will be employed primarily to relieve bottlenecks and offset the trade deficits of the country providing the workers, but they will have only a limited impact on overall shortages.

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[6] Reflecting the increased emphasis on vocational rather than general training, the share of full-time general secondary school graduates admitted to full-time programs in higher schools has declined from 41 percent in 1965 to 23 percent in 1980.

One other group that Moscow could tap is the military, although it is unlikely to do so. Reducing the number of conscripts would not increase the total labor supply (which includes the military), but it would increase civilian employment. Such a move would have only a one-time impact, however, and would involve a drastic shift in Soviet military strategy, operating practices, and procurement programs.[7]

Moreover, a recent decree limiting deferments for higher education suggests that Moscow intends to maintain the current size of its armed forces. The changes in the military service law which took effect on 1 January 1982, will add a number of formerly college-bound persons to the conscription pool. In the short run, the number of higher school graduates will decrease; as this group is demobilized the labor force will gain a larger but less educated group.

Labor force growth in the 1980's

In summary, we expect that changes in participation rates will have only a negligible impact on labor force growth during the 1980s. Greater employment among persons of retirement age seems likely, but will probably be offset by declining participation rates for teenagers and females age 20–39. Significant use of foreign labor is also unlikely, given the similarly tight labor market in Eastern Europe.

Nevertheless, because of the greater concentration of workers in the age categories with the highest participation rates and the rapid increase in the pension-age population (plus a somewhat higher participation rate for this group), we estimate that roughly 4.5 million more persons will be added to the labor force than to the working age population in the 1980s (figure 3). Despite this difference, however, the average annual rate of growth of the labor force during 1981–90 will be only 0.6 percent—less than half of what it was in the previous decade (Table 2).

---

[7] To free one million persons for civilian labor would require a 20 percent reduction in military manpower. For a discussion of military manpower in the USSR, see Alan Smith, Military Manpower Supply and Demand in the Soviet Union, prepared for the 1980 US Air Force Conference on The Soviet Union: What Lies Ahead?, August 1980.

Figure 3
Increments to the Soviet Able-Bodied Population and Labor Force

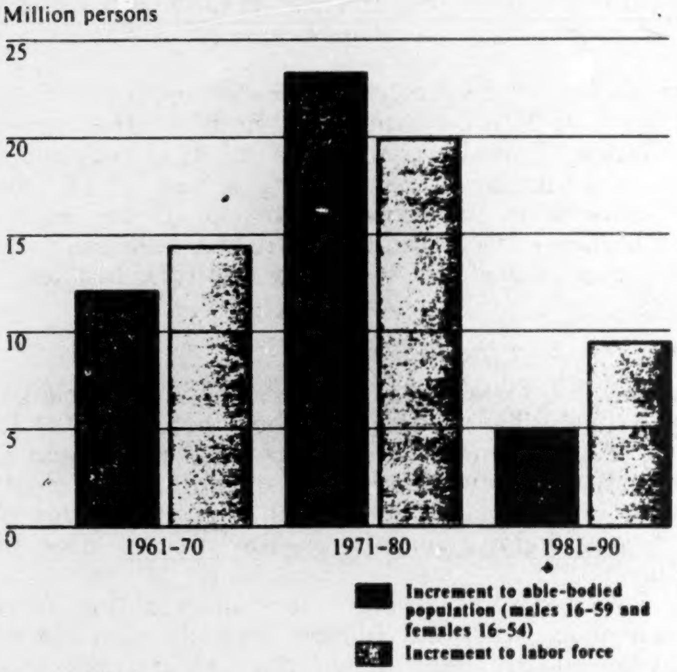

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TABLE 2.—ESTIMATED TOTAL SOVIET LABOR FORCE, 1981–91

[In thousands of persons as of Jan. 1]

	Total	Male	Female
1981	146,569	73,930	72,639
1982	147,797	74,696	73,101
1983	149,063	75,579	73,484
1984	150,164	76,349	73,815
1985	151,115	77,041	74,074
1986	151,885	77,633	74,252
1987	152,554	78,162	74,392
1988	153,187	78,651	74,536
1989	153,936	79,152	74,784
1990	154,608	79,655	74,953
1991	155,821	80,394	75,427

Regional imbalances

Moscow's labor problems, however, go beyond mere numbers. Over the next decade, the tightness in the national labor market will be exacerbated by differences in manpower availability from one region to another and between urban and rural areas. Because of wide regional variations in the birth rate, Soviet population

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growth during the last 20 years has been concentrated in the high-fertility republics of Central Asia and Kazakhstan.[8] Of the roughly 9.5 million workers who will be added to the labor force during the next decade, about 90 percent will come from these five republics. In contrast, the labor force will grow only slightly in the heavily industrialized Russian republic (RSFSR) and will remain essentially unchanged in the western republics.

Regional differences in labor force growth will have a negative impact on the economy. Workers in the southern-tier republics (which include the republics with high fertility) generally have less education, fewer skills, and less capital to work with than those in other parts of the country. More importantly, the greatest demand for workers in the 1980s will be in the highly industrialized western USSR, where the native labor force is expected to decline, and in the resource-rich, but climatically severe, area of West Siberia, which never has enough labor. Several Western scholars have postulated that large-scale migration from Central Asia to labor-deficit areas in the European USSR will offset the differing population growth rates, but there are no signs of such migration. Even if there were, it is difficult to see how Central Asians could meet the need for technical skills in the western USSR over the next decade—they are not meeting the need in Central Asia.

Urban-rural imbalances

Differences in urban-rural growth patterns will further complicate the regime's efforts to exploit available manpower reserves in the 1980s. During the past decade, the pace of urbanization continued unabated (the urban population increased from 56 percent of the total to 62 percent).[9] In the European USSR, most of the urbanization was due to an influx of young rural migrants into the larger cities of the region. As a result, rural areas of the RSFSR (like the central industrial zone and West Siberia) have a labor force that is older, less skilled, and increasingly female—a serious problem for planners seeking to increase agricultural productivity.

In contrast, rural Central Asians generally did not migrate to local urban centers in substantial numbers. Except in Uzbekistan, most of the urban growth in these republics during the past decade is attributable to the high birthrate among urban dwellers—increases which have added to the total urban population but not yet to the working-age population. The tendency of rural Central Asians to stay on the farm has thus created a growing reservoir of underused manpower in the countryside and a manpower shortage in the towns—problems which probably will worsen over the next decade.

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[8] Birth rates throughout the country have fallen since 1960. The differential among the regions has increased, however, because the drop has been much more pronounced in the European regions and the Transcaucasus.

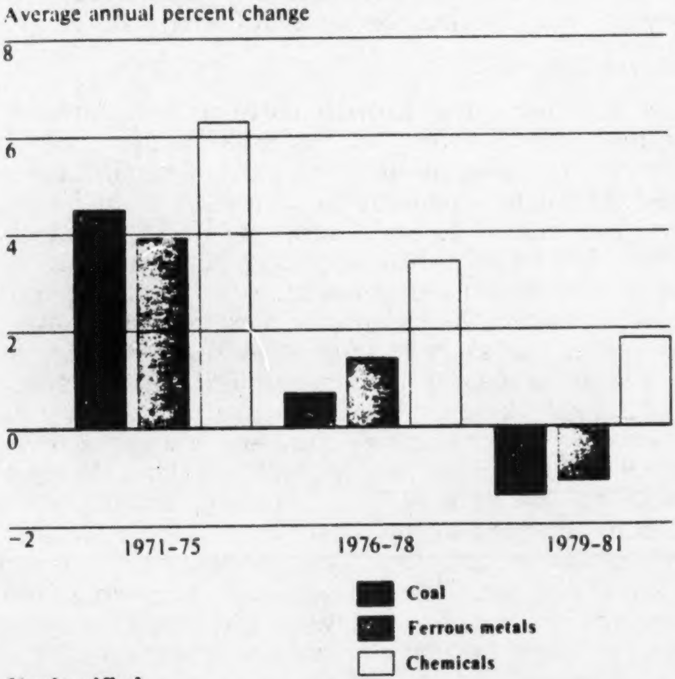
[9] Urban and rural are defined both by size of population and occupation category standards. There are, however, wide divergences in the level of urbanization among republics. Estonia, the RSFSR, Latvia, and Armenia are by far the most highly urbanized (66 to 70 percent urban), followed by Lithuania and the Ukraine (61-65 percent). Several other republics—Belorussia, Kazakhstan, Azerbaijan, and Georgia—are more than 50 percent urban, and the Central Asian republics and Moldavia are about 40 percent.

SLOWDOWN IN LABOR PRODUCTIVITY GROWTH

The effect of the employment slowdown on the economy's performance could be substantial. More than any other industrial power, the USSR has relied upon increases in the size of the labor force to spur development. Now, however, most economic growth must come from increased labor productivity. The 11th FYP calls for accelerated productivity growth (see Table 3)—according to its guidelines, 90 percent of the growth in industrial output and the entire growth in agricultural output are to come from increased productivity.

Achieving those goals will be a monumental task, however. In every economic sector, productivity growth has declined since 1975, and in some branches of industry, productivity actually fell during 1979 and 1980 (figure 4).

Figure 4
Growth of Soviet Labor Productivity in Selected Industrial Sectors



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There are a number of reasons for this sharp downturn. Some, such as the rising cost of extracting raw materials, are related to problems in specific sectors. Others, such as declining worker morale and a slowdown in the growth of labor-saving investment,

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cut across all economic sectors. Whether general or specific, their effects are felt throughout the economy.[10]

TABLE 3.—GROWTH OF SOVIET LABOR PRODUCTIVITY BY PLAN PERIOD

[Average annual percentage change]

	1971–75 (historical)	1976–80 (historical)	1981–85, 5-year plan figures
Total economy	2.1	1.2	3.4
Industry	4.4	1.8	4.4
Construction	2.4	1.1	3.0
Transportation	3.5	1.0	2.1

Sources: CIA Estimates, Pravda, Feb. 28, 1981.

Industrial plant problems

The general slowness in expanding the quality and quantity of industrial capacity has had a depressing effect on labor productivity. Construction delays have held back expansion and modernization of plant and equipment for producing a wide array of industrial products. Equipment shortages and transportation bottlenecks—occurring with increasing frequency and intensity—have increased the loss of time. These delays, together with a lack of replacement investment and incentives to encourage modernization, have prolonged the use of obsolete equipment—which in turn requires frequent, costly, and labor-intensive repairs. The rate of growth in employment of repair workers in industry has been nearly three times the rate of growth in overall industrial employment.

In addition to problems with the industrial infrastructure, a number of industry-specific problems have retarded the growth of labor productivity. In many extractive industries, particularly coal and iron ore, the rising labor costs of exploiting natural resources have virtually wiped out any productivity growth.

Worker morale problems

Another major factor underlying poor labor productivity may have been a serious decline in worker morale. Until recently, the leadership has relied on improvements in the standard of living to improve motivation. Now, however, there is increasing evidence that the Soviet workers' optimism about their standard of living in the 1960s and early 1970s has been replaced by a deep pessimism.

Among the reasons for this pessimism the most visible is the current shortage of quality food. Even before the recent harvest failures, however, worker discontent was increasing. Expectations simply have risen far faster than the government's ability to provide a consistent improvement in the standard of living. In addition, Soviet citizens appear to be much better informed than before about how their standard of living compares with those in other countries, especially in Eastern Europe—and much more upset.[11]

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[10] L. A. Kostin, "Labor Productivity in the Present Stage," Ekonomika i organizatsiya promyshlennogo proizvodstvo (EKO), No. 12, Dec. 1980, pp. 58–72.

[11] For a more detailed discussion of Soviet workers' attitudes see John Bushnell, "The Soviet Man Turns Pessimistic," Survey, Spring, 1979, pp. 1–18, and George Feifer "Russian Disorders", Harpers, February 1981, pp. 41–55.

EFFORTS TO INCREASE PRODUCTIVITY

Soviet leaders have planned a two-pronged attack for dealing with their labor problems. Their efforts to increase labor-force participation rates are discussed in the foregoing sections. They realize that additional sources of labor are limited, however, and are focusing most of their efforts on the second prong—ways to increase productivity.

So far Moscow does not seem prepared to consider a fundamental reordering of priorities or major reforms to boost material incentives for workers.[12] Indeed, its actions point in just the opposite direction. During the 11th FYP, Moscow will become more involved in the direction allocation of labor resources and will tighten labor discipline in order to ensure that priority sectors have adequate manpower and to increase labor productivity. At the same time, instead of concentrating on increasing the supply of consumer goods and services, Soviet leaders are trying to bring the supply and demand for these goods and services into closer balance by reducing the growth of consumer purchasing power.

Allocating labor resources

In an effort to increase efficiency and to channel workers into selected industries and regions, the Soviet leadership apparently has decided to become more directly involved in job placement. A part of the July 1979 decree on planning and management[13] called for ceilings on the number of workers at industrial enterprises during the 11th FYP. The Soviets have also launched a campaign to increase use of the labor placement bureaus established in 1967. These bureaus are intended to provide information on job vacancies and applicants, reducing the average time spent looking for a job. They also provide a means of channeling workers into key sectors.[14]

For a quarter of a century the labor market has been the resource market least controlled by the government. Since the mid-1950s, workers generally have been free to change jobs in reponse to higher wages or better working conditions. The state has not controlled the allocation of labor directly, as it has the allocation of investment resources. Indirectly, however—by setting differentiated wage scales among industries, for example—it has channeled workers into high-priority projects in the Far East and the Virgin

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[12] Probably the most direct acknowledgment of a link between consumer welfare and labor productivity came in an unusually frank article by a prominent Soviet sociologist last year. After reviewing the current economic situation, the author concludes that it is "not accidental" that the current decline in the growth of labor productivity has taken place against a background of food and other consumer goods shortages. She adds that large investments in productive machinery will fail to increase productivity unless they are accompanied by large increases in the production of consumer goods. See T. I. Zaslavskaya, "Economic Behavior and Economic Development" Ekonomika i organizatsiya promyshlennogo proizvodstva (EKO), March 1980, pp. 15–33.

[13] In recent years, the Soviet Government has issued a large number of decrees that affect all facets of the labor market—participation rates, training levels, allocation, etc. For a list of these decrees and their major points, see appendix A.

[14] Reflecting their growing importance, the number of labor placement bureaus increased from roughly 370 in 1977 to over 650 in 1980. It is estimated that these bureaus place about 15 percent of those employed in the national economy. See I. Maslova, "Labor Placement Service: Development Trends and Methods of Improvement," Sotsialisticheskiy trud, No. 7, 1981, pp. 64–70, and T. Nikitina, "The Work of the Job Placement Service and Its Improvement in the 11th Five-Year Plan", Sotsialisticheskiy trud, No. 9, 1981, pp. 68–75.

Lands. The current emphasis on labor placement bureaus appears to supplement these indirect methods.

Moscow is also playing a much greater role in the job placement of graduates from both vocational-technical schools and higher and specialized secondary schools. A Council of Minister's resolution issued in April 1980 on the role of vocational-technical schools includes compulsory two-year work assignments at enterprises chosen in advance. This is a departure from the earlier, more informal job placement system.[15] This resolution comes at a time when the leadership is attempting to enlarge the vocational-technical system as the major vehicle for training skilled workers.[16]

An earlier resolution (1979) on the role of higher and specialized secondary schools increased the state's control over the distribution of highly skilled workers. Emphasizing the distortions in the supply of labor for specific industrial branches, the decree offered unspecified material incentives to attact students into particular specialties. It called for the establishment of specialized schools in Siberia, the Far East, and the central industrialized region of the RSFSR—areas where the Soviets have had difficulty recruiting and holding workers. The students, many of whom apparently will be recruited from the heavily populated areas of Central Asia, will be required to accept jobs in the regions where the schools are located.

Another program to steer workers into specific areas of the country uses "tour-of-duty" brigades, established in the early 1970s. This program entails the construction of work camps at or near remote projectd sites to which work crews are flown from base cities. For example, tour-of-duty brigades perform all exploratory drilling in West Siberia. This eases critical manpower shortages and avoids the cost of building permanent facilities in remote areas. Moreover, these brigades build about 40 percent of the facilities for Siberian oil and gas industries.

The state's growing control over the labor market and its intention to become more involved in labor allocation is also reflected in a series of administrative changes dating from the mid-1970s. In 1976 a Council of Ministers decree placed all agencies dealing with labor matters under the State Committee for Labor and Social Problems (Goskomtrud), a union-republic organ with ministerial status. Two years later Goskomtrud was given wide-ranging powers over manpower training, wages and incentives, working conditions, and social security.

Two organizations under Goskomtrud's umbrella are now being expanded: the All-Union Resettlement Committee and the Administration for Organized Recruitment (Orgnabor). These agencies played a major role in such mass migrations as the settling of new lands in Kazakhstan and Siberia in the 1950s. More recently, they have been concerned with directing urban labor to priority projects, such as large construction efforts or newly established plants that are having difficulty obtaining skilled labor.

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[15] Most vocational-technical schools are operated and supported by particular ministries and enterprises. In theory, the latter hire the workers graduating from the "feeder" schools. Assignments for the most part were not mandatory, however, and many students found jobs in enterprises other than sponsoring their education.

[16] Numerous recent speeches and articles have called for this enlargement. The Soviets trained 11 million workers in vocational-technical schools during 1976-80 and plan to train 13 million during 1981-85. This is further emphasized by the 10-fold increase in enrollments in secondary vocational-technical schools since 1970.

The current number of workers placed in industrial jobs through Orgnabor is unknown (in 1976 it handled only about 3 percent of job placements). A barrage of recent articles in the Soviet press on the need to improve labor resource management through organized redistribution of employed workers suggests, however, that Orgnabor is expanding its activities.[17]

Cracking down on lax workers

Along with taking a more direct hand in allocating scarce labor resources, the leadeship seems intent on reducing job turnover and tightening labor discipline. A resolution issued jointly in January 1980 by the Council of Ministers, the Central Committee of the CPSU, and the All-Union Trade Council harshly criticizes those who do not have jobs, those who constantly change jobs, and those who do not work at the jobs they have.[18] The resolution increases from two weeks to one month the period of notice for voluntary quits and advocates tougher disciplinary action against people who come to work drunk, are illegally absent, or avoid employment. It blames party officials, factory managers, foremen, and others in responsible positions for not enforcing the rules and calls for increased vigilance in overseeing job performance.

The major thrust is on the increased use of the "stick," but the resolution also provides some incentives: additional leave time, housing construction loans that need not be repayed, and pension increases from 10 to 20 percent for retirees with 25 years of continuous service.

Meanwhile, Soviet authorities have been expanding the use of the labor brigade—a form of grass-roots autonomy whereby a number of workers contract collectively for a specific project such as building a school. Reportedly this arrangement was devised to raise productivity through collective incentive, but it also enforces labor discipline on lax workers through group pressure.[19] According to Soviet statistics, by August 1980 the brigade form of organization encompassed 48 percent of workers in industry as a whole, including 60 percent in ferrous metallurgy and over half in shipbuilding, forestry, light industry, and machine building. The July 1979 decree on planning and management instructs enterprises to set up brigades in the hope that they will become the principal form of labor organization in the 11th FYP.

During 1980 and 1981 at least a half-dozn prominently featured articles in the Soviet press also have picked up on the theme of tightening labor controls.[20] Over the same period—and undoubtedly with the events of Poland in mind—the regime has pursued a campaign emphasizing the state's primacy in labor matters. Mikhail Suslov, secretary of the CPSU and chief Party theoretician before his death in January 1982, took a hard line in his keynote address to an all-union ideology conference held in April 1981, stressing the "strictest control" over all aspects of labor and consumption. (In fact, administratively controlling movements of labor in a period of labor shortage could do the economy more harm than good by decreasing the flexibility with which bottlenecks are responded to.) Since then a press campaign has stressed the need for "heightened vigilance" to counter the effect of reformist ideas in Poland and in the USSR.[21]

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[17] See N. Rogovskiy, "Problems of Increasing Labor Efficiency." Planovoye khozyaystvo, No. 10, October 1979, pp. 38–46; Ye. Voronin, "Better Utilization of Labor Resources," Planovoye khozyaystvo, No. 9, September 1980, pp. 34–43; and T. Baranenkova, "Work Force Reserves for the Economy." Voprosy ekonomiki, No. 5, May 1980, pp. 51–62.

[18] Since 1956, when Soviet workers were first permitted to change jobs without state approval, the rate of annual turnover for industrial workers has been about 20 percent. In some industries, such as construction, the rate is 40 to 60 percent.

[19] Brigades receive bonuses for economizing on materials or workers, or for completing a project ahead of schedule. The members themselves decide how they will divide the bonus. See D. Karpukhin, "The Economic Mechanism and Labor," Voprosy ekonomiki, No. 3, 1981, pp. 131–142, and S. Shkurko, "New Forms of Team Organization and Stimulation of Labor," Voprosy ekonomiki, No. 10, 1980, pp. 26–36.

Refurbishing the trade unions

Also with an eye toward Poland, Soviet leaders have sought to refurbish the image of trade unions as the guarantor of workers' rights.[22] Early in 1981, at the 26th Party Congress, Brezhnev chided the unions for insufficiently exercising their "wide-ranging" rights on behalf of the workers, and Aleksey Shibayev, then Trade Union Chairman, noted "all of this obliges the unions to strengthen their supervision over the decisions of all questions concerning labor, the life and life style of people. . . ." Reports from republic trade union council meetings and articles in the press also have called for increasing worker participation in management.

While making a show of response to the needs of the workers, Moscow has made it clear that to increase production is still the trade unions' number-one obligation. Since 1975, party and trade union resolutions have emphasized the unions' production-oriented functions, and the unions have become more subordinate to the party than ever before. It does seem, though—as suggested by labor-related decrees issued since mid-1980—that, on paper at any rate, the unions are expected to direct more attention to worker needs.

Material incentives

Moscow also wants to curb the growth of consumer purchasing power so as to increase the effectiveness of so-called "financial levers." In theory, the wage and incentive system should reward higher labor productivity. Since the mid-1960s, Moscow has initiated numerous reforms intended to boost the salaries of workers whose performance exceeded norms or to give greater bonuses to enterprise managers who use fewer workers (as in the widely touted Shchekino experiment).[23]

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[20] Two articles stand out in particular. L. Kostin, "Strengthening Labor Discipline," Khozyaystovo i pravo, No. 3, 1980, pp. 26–31 emphasizes the need for increased labor discipline and cites the implementation of the January 1979 decree as essential to it. Similarly, a major editorial in Sotsialisticheskaya industriya on 4 July 1980 quotes the Brezhnev statement on labor discipline and calls on factory managers to take a much harder line against slovenly workers.

[21] Pravda, 27 April 1981, 27 May 1981, 9 June 1981; Izvestiya, 28 April 1981, Kommunist, No. 7, May 1981; Trud, 15 May 1981; and Molodoy Kommunist, April 1981.

[22] Indicative of Moscow's concern is the change in Soviet press treatment of workers' welfare. In the spring of 1980 the press ignored strikes by auto workers in Tol'yatti and Gor'kiy, but there has been a spate of articles since the Polish strikes began in mid-1980 on the importance of settling workers' grievances. In August 1980, for example, Pravda published a number of articles sympathetic to workers and warned trade union officials to heed letters from workers as "barometers of public opinion." In April 1981 a CPSU Central Committee resolution called for a survey of worker attitudes—no doubt an effort to show sympathy for grievances and complaints.

These programs have had little effect. Workers generally have been loath to work harder, because their money income has already outstripped the availability of what they would like to buy.[24] And factory managers continue to hoard workers, because—in practice as opposed to theory—the number-one criterion of performance is to meet planned output (regardless of cost).

Although Moscow recognizes these problems, the gains in living standards or the reforms necessary to evoke substantial productivity gains are not in the offing. Even if harvests return to the average during the next three years, the chances are small that Moscow can recapture the momentum of the late 1960s and 1970s in improving the diet. Moreover, gains in the production of other consumer goods, notably durables, will be limited by the stiff competition for resources from defense programs and from investment.

As an alternative to increased production, Soviet planners are looking for ways to cut down on annual increments to consumer purchasing power. In mid-1979, they increased the prices on a number of luxury goods substantially: automobiles by 18 percent, imported furniture sets by 30 percent, jewelry by 50 percent, and beer by 48 percent. In September 1981 further price increases on luxury goods went into effect. Most of these items are scarce and are traded extensively on the black market, probably at prices far in excess of the recent increases. In 1981 Nikolay Glushkov, Chairman of the State Price Committee, said:

> The preservation of the stable level of retail prices for the basic edible and nonedible commodities cannot mean the administrative freezing of retail prices for all commodities. . . . There must be a different approach to prices of commodities for which there is a mass, daily demand, on the one hand, and individual groups of what might be called prestige commodities, on the other hand.

A good deal of consumer purchasing power could be absorbed by an increase in the fixed prices of housing and food. The basic rent has not changed since 1928—although recently there has been public discussion of possible rent increases.[25] Maintaining the constant level of food prices at state retail outlets still appears to be sacrosanct; Soviet leaders continue to promise price stability for basic foodstuffs. The recent disturbances in Poland are clearly on their minds.[26]

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[23] For a detailed discussion of these reforms, see Gertrude Schroeder, "The Soviet Economy on a Treadmill of Reforms," Soviet Economy in a Time of Change, Vol. I, Joint Economic Committee, Washington, D.C., October 10, 1979, pp. 312–340.

[24] An indicator of the growth of money income is the buildup of savings deposits. At the end of 1970, savings deposits totaled 46.6 billion rubles, 30 percent of retail sales. At the end of 1980, they totaled roughly 156.5 billion rubles, equivalent to 58 percent of annual retail sales.

[25] Subsidies to cover the difference between rents actually paid and housing costs to the state stand at 3 billion rubles.

[26] It currently costs the Soviet Government 25 billion rubles a year in subsidies to maintain the official food prices. The subsidies cover the difference between the higher "farm gate" price and the lower price charged in state retail outlets. Prices at collective farm markets, however, have more than doubled since 1970.

WHAT LIES AHEAD

Productivity growth during the 1980's

Workers are likely to perceive the government's corrective measures—a slowdown in wage increases coupled with strict controls on the factory floor—as a turning back of the clock to less prosperous times. The labor disturbances at Tol'yatti and Gor'kiy in 1980 were triggered by food shortages, but they also apparently involved low pay and poor working conditions. In such an environment, the leadership is unlikely to get the worker participation, interest, and effort that it wants.

The point at which disappointment over the economy's performance results in serious labor trouble cannot be predicted, but such a possibility already worries the leadership.[27]

Moving toward the mid-1980s, as growth slows and the USSR experiences difficulties and failures in achieving the goals of the 1981–85 plan and the annual increments to the labor force become smaller, Moscow may have to adopt even further restrictive measures in an effort to raise output. For example, it could extend the workweek or try to sharply limit workers' ability to change jobs. The current economy, however, is vastly different in both scale and complexity from that of the Stalin era, when strong-arm tactics were the rule. A tough approach to labor might keep productivity growing at its present low rate, but it probably would do little to boost it in the long run and certainly would add to tensions in the work force.

Long-term policies: Some hope for the future

Because prospects for boosting labor productivity by improving living standards during the 1980s are not bright, Soviet leaders are pursuing a number of policies which, over the longer term, could ease their labor difficulties.

Automation and mechanization

The most promising long-term policy involves an effort to substitute capital for labor by mechanizing and automating labor-intensive industrial processes. This has been declared one of the five major tasks of the 11th FYP.

Despite the system's poor record, the potential for drawing upon the "hidden labor reserves" is there. Roughly half of all industrial workers in the USSR perform manual labor, and the rate at which this share declines has been glacial—about one-half a percentage point each year. Moreover, most of these manual laborers are engaged not in production but in such labor intensive auxiliary processes as loading, transport, repair work, and storage operations.

Increased automation, however, will require an acceleration in investment in modern machinery and equipment—which Moscow cannot accomplish quickly. Mechanization and automation had high priority in the 1976–80 plan period, but Soviet industry made little progress in mechanizing auxiliary processes because it failed to turn out large quantities of specialized materials handling quipment.[28]

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[27] Evidence of this concern has been the widespread use of special food distribution systems at the factory level in recent years. These systems please the workers, who are most likely to demonstrate their dissatisfaction, and shift the pressure to groups who are less likely to demonstrate, like the elderly.

Regional shifts in capital investment

Some planners have been advocating a rise in the relative share of investments in Central Asia and other labor-surplus areas and the 11th FYP does schedule several labor-intensive projects for Central Asia, primarily in the light and food industries. Nevertheless, any shift in the regional investment patterns—which historically have slighted the labor-surplus areas in the southern-tier republics—will come slowly, if at all.[29]

During the 1980s, Central Asia will face severe competition for any new investment rubles from Siberia and the European USSR. Because of increasing stringencies of supplies of raw materials in the industrial heartland west of the Urals, massive investments in Siberia are needed to find, extract, and transport its energy and other raw materials. In 1979, for example, investment in energy development, principally in Siberia, accounted for almost half of the growth in new investment. In addition, the European USSR has many existing facilities that can be modernized and expanded—a more efficient use of investment rubles than building new plants in Central Asia. The further slowdown in investment growth, coupled with these competing needs, means that during the 11th FYP the possibility of rapid expansion of new plant and equipment in Central Asia is slight.

Increasing the birth rate

Finally, troubled by labor shortages, the government is formulating a pronatalist demographic policy—clearly a long-term corrective measure. It has moved slowly in implementing this policy, however, because of the enormous costs of developing the necessary infrastructure—expanded day-care facilities, increased housing, improved social amenities and consumer services. The government has also moved slowly because of political sensitivity over whether to adopt a uniform policy for the entire USSR or one aimed at boosting birth rates only in low-fertility regions—which are predominantly Slavic. The reports by President Brezhnev and Premier Tikhonov at the 26th Party Congress seem to endorse the regional approach. Their proposals, which call for lump-sum grants for first, second, and third births and one-year partially paid maternity leave for working mothers, will be introduced gradually—first in the Soviet Far East and Siberia. These are predominantly Slavic regions characterized by low fertility and high female employment.[30]

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[28] To cite two examples, in 1975 the Ministry of Electrical Equipment Industry was slated to produce 7,000 electrical forklifts, with output scheduled to climb to between 24,000 to 27,000 by 1980. In fact, the Ministry produced fewer than 5,800 electric forklifts in 1975, and its 1980 plan had to be revised downward to less than 9,400. The Ministry of Automobile Industry has a record almost as bad. According to an official of the State Committee on Materials and Technical Supply, the Ministry satisfies only 50 percent of the plan for auto-forklifts annually, with the figure for some specialized types of loading equipment as low as 11 percent.

[29] For a discussion of Central Asian regional development, see S. Enders Wimbush and Dimitry Ponomareff, Alternatives for Mobilizing Soviet Central Asian Labor: Outmigration and Regional Development, Rand Corporation, 1979, and Murray Feshbach, "Prospects for Outmigration from Central Asia and Kazakhstan in the Next Decade", Soviet Economy in a Time of Change, Vol. I, (Washington, D.C., Joint Economic Committee, 1979), pp. 656–709.

Any successful pronatal campaign, however, would mean at least temporary withdrawal of more women from the labor force and thus some short-term costs to the economy. The gains would not be realized until after the year 2000, when the new persons would begin to reach working age.

APPENDIX A—RECENT LEGISLATION AFFECTING THE LABOR FORCE

The USSR has issued numerous decrees since December 1975 to cope with the tightening labor market and to increase the effectiveness of the labor force. The compilation presented here is lengthy, but not all inclusive. It groups the decrees into four categories—training, supply, productivity, and allocation—and provides the title, date, issuing authority, and a brief summary of major provisions.

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[30] Boris Urlanis, the late Soviet demographer, recently suggested economic measures favoring urban over rural areas for child support payments, increases in the share of wages paid during maternity leave for second and third children and additional incentives for raising large families in certain areas—measures which would mostly benefit Slavic women. He also called for a migration policy using the "entire system of social, economic, legal, and administrative levers" to stimulate an exodus from rural areas with relatively unproductive labor surpluses. See "Demographic Science and Demographic Policy," Vestnik Akademiya Nauk SSSR, No. 1, Jan. 1980, pp. 41–49; see also Cynthia Weber and Ann Goodman, "The Demographic Policy Debate in the USSR", Population and Development Review, Vol. 7, June 1981, pp. 279–295. Guidelines for the 11th FYP also echo many of these suggestions, in addition to calling for greater use of part-time employment for women with young children and increasing the network of extended day-school programs, kindergartens, and creches in areas of high female employment.

APPENDIX A.—RECENT LEGISLATION AFFECTING THE LABOR FORCE, 1975–82

Title	Date issued	Issuing authority	Major provisions/comment
I. TRAINING			
On the Further Improvement of the Training Process and Education of Pupils in the Vocational and Technical System.	September 1977	Central Committee CPSU, Council of Ministers USSR.	Expands vocational and technical school training, particularly at the secondary level. Stipulates vocational/technical schools as major vehicle for training future workers. Provides three-year course of study for eighth grade graduates, to include occupational training and general secondary training. Establishes one- to two-year course of occupational training for 10th-grade graduates of general secondary schools.
List of occupations for workers in upper wage-skill categories which require specialized secondary education.	September 1977	Goskomtrud	Calls for growth of a "wage worker-intellectual" class of people with specialist training doing blue collar jobs, albeit at a higher pay scale.
On Further Improving the Training and Education of Pupils in General Education Schools and Their Preparation for Work.	December 1977	Central Committee CPSU, Council of Ministers USSR.	Increases vocational training in grades 9–10 from two to four hours weekly Emphasizes practical labor education at enterprises, collective, and state farms near the school. Changes curriculum, study programs, and textbooks to ensure polytechnical or labor orientation of education. Arranges for planned integration into labor force of general secondary school graduates who do not continue their education.
Improving the Planning and Training of Specialists and the Utilization of Graduates of Higher and Specialized Secondary Schools in the National Economy.	January 1978	Council of Ministers USSR	Seeks to improve the training, distribution, and use of specialists by: (1) using labor balances more extensively in devising annual and five-year plans; (2) locating specialized secondary schools near territorial-production complexes; (3) centralizing training on basis of available equipment and personnel; (4) establishing sectoral plans based on need for specialists; (5) establishing model schedules for specialist positions, particularly correlating relationship of engineers and technicians; (6) improving allocation plans for graduates; and (7) ensuring that job assignments are based on training and qualifications.
On Measures for Further Improving the Study and Teaching of Russian Language in Union Republics.	October 1978	Council of Ministers USSR	Provides for smaller student-teacher rates in Russian language classes in non-Russian schools. Grants republic education ministries latitude in expanding Russian language instruction at the expense of the rest of the curriculum.

APPENDIX A.—RECENT LEGISLATION AFFECTING THE LABOR FORCE, 1975-82—Continued

Title	Date issued	Issuing authority	Major provisions/comment
Further Development of Higher Education and Raising the Quality of Specialists' Training.	July 1979	Central Committee CPSU, Council of Ministers USSR.	Improves the quality of technical training. Establishes training centers in Siberia, Far East, and nonchernozem zone of RSFSR. Assigns graduates to jobs in local areas to reduce turnover. Offers unspecified material incentives to woo students to less popular specialities. Permits secondary school graduates to enter higher schools in certain specialties on the basis of two instead of four entrance examinations. Assigns higher school graduates to jobs one to three years before graduation. Plans call for eventually assigning jobs five years before graduation.
On Measures for Further Improving the Training and Raising the Qualifications of Workers at Their Place of Work.	April 1980	Council of Ministers USSR	Expands production training facilities. Provides for intensive management training for administrators of on-the-job training programs. Emphasizes the training of female workers, including full-time training programs with pay for women with young children.
Regulations Regarding Vocational-Technical Schools of the USSR.	April 1980	Council of Ministers USSR	Requires vocational-technical school graduates to accept compulsory two-year work assignments chosen before their graduation. Reaffirms primacy of vocation-technical schools as major vehicle for training labor force.
II. LABOR SUPPLY			
On Additional Measures for Improving Working Conditions for Women Employed in the National Economy.	July 1978	Concil of Ministers USSR and Union Republics, Goskomtrud, Presidium of All-Union Central Council of Trade Unions.	Excludes women from dangerous or heavy work as of 1 January 1981. Lists occupations closed for women. Provides retraining without loss of pay or pension benefits. Unlikely to be implemented fully, since a large share of these dangerous or heavy jobs—80 percent of all manual construction jobs, for example—are held by women.
On Measures for Increasing Pension Benefits for Those Working After Reaching Pension Age.	October 1979	Goskomtrud, Secretariat of All-Union Central Council of Trade Unions.	Increases pensions by 10 rubles monthly (up to 40 rubles) for each year worked beyond retirement age, effective Jan. 1980. Broadens eligibility of groups able to retain all or part of pension while continuing to work.
Improving Working Conditions for Women Having Children and for Those Working Part Time.	April 1980	Goskomtrud, Secretariat of All-Union Central Council of Trade Unions.	Encourages women with young children to work part time. Guarantees pay and all benefits on prorated basis.

Changes to "Law on Universal Military Service".	Dec. 17, 1980	Presidium of Supreme Soviet of USSR	Amends 3 articles of military service law effective 1 Jan 1982. Limits draft deferments for continuing higher education to students at institutes approved by Council of Ministers. Reduces deferments for health reasons from 10 to 5 years.
On Measures to Further Improve the Population's Social Security.	March 1981	Central Committee CPSU, Council of Ministers.	Increases minimum monthly pension rate to 50 rubles for workers and employees and 40 rubles for collective farmers. Raises annuity for those who have been retired more than 20 years to make it more comparable with current standards. Requests union republic authorities, USSR ministers, and departments to expand opportunities for pensioner participation in economy, emphasizing flexible work schedules.
On Measures to Increase State Assistance to Families with Children.	March 1981	Central Committee CPSU and USSR Council of Ministers.	Provides 12-month partially paid maternity leave of 50 rubles for working mothers in Siberia and the Far East and 35 rubles per month for those in other regions. Provides additional leave on request (without pay) until child is 18 months. Increases and upgrades all types of child-care facilities, particularly those in "areas with a high level of female employment". Provides wider implementation of part-time work schedule for working women. Grants working mothers with children below age 12: (a) additional three days' paid leave; (b) priority in scheduling vacation time; (c) two weeks additional unpaid leave to care for children; and (d) 14 days paid leave to care for sick children. Gives preferential treatment for newlyweds and families with children in obtaining individual or cooperative housing.
III. LABOR EFFICIENCY			
Standard Regulation on the Production Brigade and Team Leader.	December 1975	Goskomtrud, Secretariat of All Union Council of Trade Unions.	Bases all pay and bonuses on final result of work. Calls for reducing turnover by collective discipline.
Procedure for Using the Shchekino Method of Improving the Organization of Labor, Material Stimulation, and Planning.	April 1978	Goskomtrud, Gosplan Ministry of Finance, All-Union Central Council of Trade Unions.	Encourages expansion of the Shchekino experiment to increase labor productivity (in an effort to reduce number of workers and save on wage fund). Enterprises can use the following as incentives for introducing Shchekino: (1) an additional payment of up to 30 percent of wage rate or salary for all workers, employees, and management personnel who exceed planned production with decreased work staff; (2) pay bonuses to those who devise labor-saving ideas; (3) distribute savings in wage fund obtained by freeing workers.

APPENDIX A.—RECENT LEGISLATION AFFECTING THE LABOR FORCE, 1975–82—Continued

Title	Date issued	Issuing authority	Major provisions/comment
Recommendations for the Development of the Brigade Form of Organizing Labor and Providing Incentives to Workers at Machine Building and Metal Working Enterprises.	January 1979	Goskomtrud, Secretariat of All-Union Central Council of Trade Unions.	Emphasizes increasing labor productivity by improving planning and management, reducing production times, and increasing labor discipline. Distributes bonus payments on basis of brigade's performance and individual productivity, rather than on basis of individual's wage rate. (Standard regulations based on these recommendations were adopted in December 1980.)
On the Improvement of Planning and the Intensification of the Influence of the Economic Mechanism on the Increase of Production Efficiency and Work Quality.	July 1979	Central Committee CPSU, Council of Ministers, USSR.	Most comprehensive decree in past decade. Touches on all facets of the economy. (Numerous subsequent decrees were required to implement all its provisions.) It calls for: (1) emphasizing productivity in planning indicator; (2) placing ceilings on enterprise staff rosters; (3) tying wage fund to normative outlay of wages per ruble of sold output; (4) linking size of incentive fund to productivity and product quality.
On the Further Strengthening of Labor Discipline and Decreasing Turnover of Cadres in the National Economy.	December 1979	Central Committee, CPSU, Council of Ministers, USSR, All-Union Central Council of Trade Unions.	Stresses reducing turnover and galvanizing and putting pressure on work force. Requires one month's written notice of intent to resign from job. Advocates disciplinary action against people who come to work drunk, are illegally absent, or avoid employment. Increases increments to pension for continuous service of 25 years from 10 percent to 20 percent. Adds leave time for continuous service for blue and white collar workers with 15 days of vacation. Provides nonrepayable loans for cooperative and individual housing construction for those who have worked for five years or newly-weds who have worked for two years.
Instructions on determining the index for reducing the use of manual labor in industry in accordance with the draft plan of economic and social development for 1981–85.	March 1980	Confirmed by Gosplan USSR, Central Statistical Administration (TsSU) USSR.	Implementing instructions based on July 1979 decree on organization and management. Seeks to mechanize particularly dangerous or labor-intensive work. Calculates norms for reducing manual labor in industry on proportion of manual workers to total workers at the end of each year.
Instructions on Establishing Ceiling on the Number of Workers and Employees for the 1980 Labor Plan.	February 1980	Confirmed by Gosplan, USSR, and TsSU USSR.	Implementing instructions for 1980 Plan. Seeks to limit the number of workers and employees at production enterprises. Establishes monthly quotas in conformity with quarterly and annual limits. Requires part-timers and those who work at home to be counted against the annual quotas. (This provision undermines previous decrees aimed at increasing part-time employment.).

On Measures to Limit the Increase and to Reduce the Number of Personnel in the Management Apparatus and Certain Sectors of the Nonproduction Sphere.	November 1981	Council of Ministers USSR	Reduces to 1980 levels employment in scientific, research and design organizations, educational and other cultural institutions and supply enterprises. Stipulates that growth in employment in trade, housing and the government bureaucracy will be restricted.
"On the Procedure and Conditions for Combining Professions".	January 1982	Council of Ministers USSR	Formalizes and consolidates a number of existing schemes to encourage combining positions to economize on the use of manpower. Allows production workers and auxiliary workers to receive up to 50 percent of basic wage rate and ITRs, employees in production sectors and all workers in non-production sectors to receive up to 30 percent of basic wage rate.

IV. LABOR ALLOCATION

"On the Timely and Systematic Attraction of Graduates of General Secondary Schools into Work in the National Economy in 1978".	June 1978	Goskomtrud, Central Committee, Komsomol	Improves job placement and labor education of young people in order to attract general secondary school graduates to production and service areas. Seeks compulsory job placement for those not continuing schooling. Assures that majority of those going to work in production learn a trade in technical school.
Summary of Job Placement of Graduates of General Secondary Schools in 1979 and Tasks of Organs of Labor, Vocational-Technical and General Education Schools, Komsomol Committees for Directing Youth to the National Economy and Vocational-Technical Schools in 1980.	January 1979; March 1980	Goskomtrud State Committee for Vocational-Technical Education, Ministry of Education, USSR Secretariat of All-Union Central Council of Trade Unions.	Provides follow-up summary of placement of general secondary-school graduates by branch of economy. Calls for increased use of technical programs for training young people. Instructs Goskomtrud to control job placement of graduates. Increases informational role for Komsomol to reduce high turnover rates among young people.
Acting Regulations on State Control of the Use of the Work Force.	September 1978	Goskomtrud	Gives Goskomtrud expanded control over labor force, including authority to change labor plans for use of workers and employees, to reduce turnover, and to increase productivity.
Confirmation of Instructions on Resettlement of Collective and State Farm Families Involved in Livestock Products Production.	May 1979	Goskomtrud	Provides for resettlement of families involved in agriculture to areas experiencing shortages of workers. Stipulates size of agricultural settlements. Awards monetary bonuses on arrival and after completion on one year of work, depending on location chosen. Grants housing credits based on location; Far East needs greatest number of settlers, but Kazakhstan and nonchernozem zone of RSFSR and are now on a par with Siberian economic regions.
On the Conditions for Bureaus of Job Placement for the Population.	December 1980	Goskomtrud	Increases use of job placement bureaus. Places them under authority of Goskomtrud of union republics. Expands the bureaus' function to include job information, placement, resettlement, and counseling for those out of labor force.

SOVIET TRADE UNIONS AND LABOR RELATIONS AFTER "SOLIDARITY"

By Blair A. Ruble*

OVERVIEW

The Soviet concept of dual-functioning trade unions assumes that unions in a socialist society have two divergent functions: on the one hand, they exhort workers to produce more; on the other, they defend the rights and interests of union members as those rights and interests are defined by law. In seeking an optimal balance between these functions, Soviet trade unions have at times attached greater importance to one or the other function. Discussions long underway among officers of the official unions over the appropriate balance among union functions have intensified following the rise of the Solidarity movement in Poland. Elsewhere in Soviet society, there are some signs that workers are now somewhat more willing than in recent years to express their discontent either through work actions or, in extreme cases, through the organization of independent trade unions. This article attempts to assess the impact of the events in Poland upon both the official unions and the workers themselves. In so doing, it seeks to define the nature of the Soviet trade union movement, the relationship between the Communist Party and the unions, and the possible future shape of union activities.

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Just eleven days before the opening of the Seventeenth Trade Union Congress in March, 1982, Aleksei Shibaev was removed from his post as Chairman of the All-Union Central Council of Trade Unions (AUCCTU).[1] He was replaced by Stepan Shalaev, previously Minister of the Timber, Pulp-and-Paper and Woodworking Industry. Prior to becoming a minister in 1980, Shalaev had served for twelve years as a Secretary of the AUCCTU, and for five years before that as Chairman of the Central Committee of the Timber, Pulp and Woodworking Industry Workers' Union. Shalaev was the first trade union official to rise to the head of the Soviet Union hierarchy in over fifty years.[2]

No convincing explanation was provided for the change which, coming as it did shortly after the death of Mikhail Suslov, only encouraged speculation that the post-Brezhnev succession had already begun.[3] In addition to the possible connection with high level political struggles, the emergence of "Solidarity" in Poland may have helped to erode Shibaev's position. As Soviet political and union leaders began to assert more boldly than ever that only Soviet-styled unions were appropriate under Socialism, Shibaev—an older and uninspiring man with no previous union experience—must have appeared to be a less than credible spokesman for the Soviet trade union movement. To understand why this might have been the case, it is important to review Shibaev's appointment to the AUCCTU Chairmanship in the first place.

Aleksandr N. Shelepin had been trade union chief before Shibaev. Shelepin replaced Viktor Vasil'evich Grishin as AUCCTU Chairman in June, 1967 in a move seen by many as a demotion for the politically aggressive Shelepin.[4] Shelepin served as head of the Young Communist League (Komsomol) from 1952 until 1958, and then as Chairman of the KGB from 1958 until 1961, before becoming a powerful Central Committee Secretary and a potential rival to the Brezhnev-Kosygin-Podgorny troika ruling the Soviet Union during the late 1960s. As AUCCTU Chairman, he retained his Politburo status while heading up an institution which had not been at the center of power for decades. Shelepin proved to be too able an administrator for the unions to languish under his control. Indeed, the unions gradually accumulated greater stature and resources during his tenure as their leader. The air of authority with which Shelepin always acted was transmitted to his subordinates. Some six weeks before Shelepin's unexpected ouster, an AUCCTU department chief was heard to exclaim, "Ministers are like children to us! When they give us trouble we just call on Aleksandr Nikolaevich [Shelepin] and he sets things straight."[5]

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[1] "Informatsionnoe soobshchenie o plenume Vsesoiuznogo Tsentral'nogo Soveta Professional'nykh Soiuzov" Trud, March 6, 1982, p. 1.

[2] "Predsedatel' VtsSPS S.A. Shalaev," Trud, March 6, 1982, p. 1.

[3] D. Doder, "Top Soviet Labor Official Is Ousted," The Washington Post, March 6, 1982, p. A14.

[4] Michel Tatu, Power in the Kremlin, From Khrushchev to Kosygin, trans. by H. Katel (New York: The Viking Press, 1968), pp. 197-200, 503-508.

In early 1975, Shelepin traveled to England, where he was greeted by boisterous demonstrators protesting the presence of a "KGB unionist" in the British Isles. Shelepin was removed from his union post shortly after returning to Moscow. Although this displacement, like his earlier appointment, probably come as a result of his personal struggles and disputes with Brezhnev, Shelepin should be seen as an effective union chief executive. He fought to expand union influence within official circles if for no other reason than such a gain would also increase his own power.

Following Shelepin's removal, the AUCCTU chairmanship remained vacant for almost a year-and-a-half. During this period, some union officials privately expressed the view that the next union boss should be a union man.[6] As an interim measure, AUCCTU Secretary V.I. Prokhorov fulfilled the administrative duties of the chairman.[7] In November, 1976, the AUCCTU announced that A.I. Shibaev, formerly Communist Party First Secretary of the Saratov Region, had become union chairman.[8] As had been the case with every other AUCCTU chairman since Stalin forced the removal of Mikhail Tomsky in 1929, Shibaev had no previous union experience.

Over the course of the post-Shelepin era, Party and union resolutions slowly but perceptively came to favor a more production oriented approach to union duties than had previously been the case. Yet, by 1978, Shibaev and some other major union figures were once again demanding that local union agencies do more to protect workers against managerial "mistakes."[9] The issue of the appropriate balance among union functions was beginning to emerge once more just as the independent trade union movement Solidarity erupted in Poland. Soviet politicians began to portray Soviet trade unions as the protector of the Soviet working class.[10] Shalaev, a younger man with a reputation as an effective troubleshooter and long service to the unions, better represented the image Soviet trade unions would like to project.

RECENT CRITICISMS OF TRADE UNION ACTIVITIES

The fall of Shibaev is but the most prominent manifestation of concern over the effectiveness of Soviet trade unions in the post-Solidarity era. Shalaev assumed leadership of the unions at a time when the Soviet media was full of criticism of union actions. During the week following Shalaev's appointment, Pravda published an article by the Tula Communist Party Regional First Secretary I. Iunak, in which the author concluded that some trade union agencies in his region were often little more than an appendage of economic management.[11] Meanwhile, the union daily Trud was running three major and, at times, critical commentaries on union performance. In the first, TASS correspondent V. Kulikov interviewed AUCCTU Deputy Chairman V. Prokhorov concerning union handling of worker letters of complaint.[12] According to Prokhorov, the number of such leters were growing and demanded considerable attention. Still, Prokhorov portrayed the declining number of complaints about wage problems as evidence of an improving living standard among Soviet workers.

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[5] Interview; February, 1975.

[6] Interview; May, 1975.

[7] For example, Prokhorov presented the AUCCTU report at the Twenty-Fifth Party Congress in February, 1976 (Kommunisticheskaia partiia Sovetskogo soiuza, XXV s"ezd, Stenograficheskii otchet (Moscow: Poli. lit., 1976), vol. 2, pp. 128–133.

[8] "Informatsionnoe soobshchenie o plenume Vsesoiuznogo Tsentral'nogo Soveta Professional'nykh Soiuzov," Trud, November 24, 1976, p. 1.

[9] A. Viktorov, "V interesakh liudei truda," Trud, December 1, 1982, p. 2.

[10] "Nadezhnaia opora partii v massakh" Pravda, December 25, 1981, p. 2.

If Prokhorov could find the rising number of letters of complaint from workers praiseworthy, Politburo member V. Shcherbitskii, First Secretary of the Ukrainian Communist Party's Central Committee, published a more hard-hitting account of inadequate union performance later the same week.[13] According to Shcherbitskii, the unions were a powerful force for increased productivity and improved quality of life. However, he noted, "in the work of many trade union organizations there are still not a few mistakes: formalism, sensationalism, and, now and then, an irresponsible attitude to business." The next day, A. Viktorov, an AUCCTU Secretary, reviewed union sponsored supervision of the trade sector and found that "not all union councils and committees took the necessary steps to strengthen worker control over trade, public dining facilities and consumer services."[14]

Some of these same concerns were voiced a week later by Leonid I. Brezhnev when he addressed the Seventeenth Trade Union Congress.[15] Brezhnev began his speech by noting an arsenal of means, large and small, which existed for the unions to influence social processes, the development of the economy and the education of the masses. He wanted to know if these means were used effectively. His answer was "evidently not." Observing that it was impossible to guarantee the growth of the national welfare without increasing production ("an axiom of the socialist style of life"), Brezhnev demanded that the unions do more to guarantee enforcement of Soviet laws protecting the rights of Soviet workers. He continued that it would be necessary to create an appropriate socio-psychological and moral atmosphere at the work place so that people could be more productive. Such an atmosphere depended upon the unions battling "bureaucratism" while seeking more democracy at the workplace.

Before turning to international concerns, Brezhnev noted that "enemies of socialism—bourgeois ideologists, reformers and revisionists—have long gambled on the alienation of unions from Marxist-Leninist parties, forcefully thrusting forward the theory of 'neutral' trade unions." Brezhnev then stated that the unions could only succeed in meeting their obligations by rejecting this approach. In arguing in this manner, Brezhnev once again asserted the unassailable character of Communist Party supervision of trade unions under the conditions of socialism.

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[11] I. Iunak, "Povyshenaia rol' profsoiuzov," Pravda, March 9, 1982, p. 2.

[12] V. Kulikov, "Za kazhdym pis'mom—chelovek" Trud, March 8, 1982, p. 2.

[13] V. Shcherbitskii "Razvivat' tvorchestskuiu aktivnost' mass," Trud, March 11, 1982, p. 2.

[14] A. Viktorov, "Na postu rabochei kontrolery," Trud, March 12, 1982, p. 2.

[15] "Zabotu o liudiakh truda, zabotu o proizvodstve— v tsentr vnimaniia profsoiuzov. Rech' tovarishcha L. I. Brezhneva," Trud, March 17, 1982, pp. 1-2.

Such criticisms are not new. Discussions of union failings have occurred throughout Soviet history. Indeed, the language of some of the more critical among the recent assessments of union performance could well have been lifted directly from previous critiques. Nonetheless, the context in which these commentaries are offered has changed considerably since the Gdansk strikes of August, 1980. A variety of mass/elite linkages have become the object of renewed interest in the Soviet Union to a degree which can be explained at least in part by concern over the rise of Solidarity: some republican Communist Party bureaus (the republican equivalent of the national Politburo) have added workers to their ranks for the first time in years;[16] several Communist Party officials have encouraged public opinion survey programs;[17] local Party officials have urged managers and political leaders to take citizen letters of complaint more seriously;[18] and a few commentators have dusted off long standing recommendations for the direct election of some factory officials.[19] In April, 1982, KGB Chairman Andropov noted that there is not a society, capitalist or socialist, where there are not differing and discordant views and interests.[20] He continued that, under socialism, such differences are not based upon class antagonisms as is the case under capitalism. Finally, the impact of the rise of Solidarity upon Soviet discussions of trade unionism is most pronounced in the renewed vigor with which trade union—Communist Party ties are discussed and defended.

No Soviet trade union official openly challenges the union' subordination to the Communist Party. Indeed, some enthusiastically support that relationship. In March, 1981, for example, Aleksei Shibaev defined the role of the trade unions in a socialist society for an article in Kommunist, the theoretical and ideological journal of the Central Committee of the Communist Party of the Soviet Union.[21] In his article, Shibaev attacked the notion that trade unions in socialist societies could fail to acknowledge the leadership of the Communist Party. Such ideas were generated, he suggested, by "opponents of socialism" who have frequently sought to "free" the unions from Party influence. The proponents of such views, Shibaev continued, do not understand the fundamental difference between the function of trade unions under capitalism—where laborers are fighting against monopolies and the power of the bourgeois, exploitative state, and socialism—where the workers are themselves the masters of their own country. As Shibaev acknowledged, the Leninist concept of dual functioning trade unions remains the central feature of unionism in a socialist state. According to that concept, unions in a socialist society have two divergent functions: on the one hand, they exhort workers to produce more; on the other, they defend the rights and interests of workers as those rights and interests are defined by law.

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[16] For example, in early 1981 workers were added to the Party bureaus of the Armenian, Azerbaidzhani, Georgian, Latvian and Lithuanian Communist parties during republican party congresses.

[17] A point made, for example, by Politburo member Konstantin Chernenko in an article in Kommunist ("Velikoe edinstvo partii i naroda "Kommunist, 1980, No. 7, 10-26) and by Politburo candidate member Eduard Shavardnadze at the January, 1981 Georgian Communist Party Congress (E. Bugaev, "V dukhe partiinoi vzyskatel'nosti i tovarishchestva," Kommunist, 1981 No. 3, 94-101).

[18] "Vazhnaia zadacha profsoiuzov," Sovetskaia Kirgiziia, December 6, 1981, p. 1.

[19] A. I. Tsepin, "Trudovoi kollektiv kak sub" ekt trudovogo prava," Sovetskoe gosudarstvo i pravo, 1981, No. 8, 46-54; D. Slider, "Recent Soviet Experiments in Worker Participation," unpublished paper prepared for the Workshop on Soviet Labor Management and Industrial Productivity held at the Kennan Institute for Advanced Russian Studies, The Wilson Center, Washington, D.C., March 3, 1981.

[20] Iu. V. Andropov, "Leninizm—neischerpaemyi istochnik revoliutsionnoi energii i tvorchestva mass" Pravda, April 23, 1982, pp. 1-2, p. 2.

[21] A. Shibaev, "Samaia massovaia organizatsiia trudiashchikhsia," Kommunist, 1981, No. 4, 72-83.

The concept of dual functioning trade unions emerged from the turmoil of revolution and civil war.[22] Bolshevik leaders heatedly debated the role of the unions within the new Soviet state during the Tenth Party Congress in March, 1921. Before the congress, a wide variety of conflicting views on the subject had been narrowed to three contesting resolutions on the trade union question. A. Shlyapnikov, A. Kollontai and the "Workers' Opposition" presented a syndicalist approach according to which the unions would administer major sectors of the national economy. Trotsky and Bukharin advocated the complete subjugation of the unions to the state. To their minds, the unions should manage compulsory labor programs and enforce labor discipline. The "Group of Ten," including in their number both Lenin and union leader Mikhail Tomsky, presented a third compromise proposition which ultimately carried the day. This last resolution proved less consistent internally. In presenting his position, Lenin conceded to Trotsky that the unions must help raise productivity and discipline workers. However, he continued, the unions as social organizations could not use coercion, which remains a prerogative of the state. Instead, union leaders must persuade and educate workers and develop their unions into "a school of administration, a school of economic management, a school of communism."

The 1921 discussion of the trade union question proved important because Lenin himself stated a position on the unions, a solution to the problem they presented to the young Soviet state. Furthermore, a Party Congress ratified that position. As Lenin became canonized, discussion of the role of the unions or practical suggestions as to how their work might be improved had to take Lenin's 1921 position into account. Any form of labor organization even marginally outside the parameters of that position became politically and ideologically impossible.

In recent years, Party and union leaders as well as academic theorists have argued that improved labor productivity is beneficial to the entire Soviet population. Increased production, they suggest, expands the national wealth which, in turn, improves the material and cultural well-being of the entire population, the workers included. Nevertheless, such a system does not function perfectly. Soviet labor law specialist R. Z. Livshits notes that disatisfaction with work generated by such factors as poor working conditions and irregular work cycles combine with manpower shortages and an imperfect wage system to contribute to a less than satisfactory relationship between the worker and his or her work.[23] As a result, the trade unions must defend the worker against the "bureaucratism" of economic administrators. Soviet trade unions, then, seek increased productivity while attempting to defend the worker "not between classes, but within a class."

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[22] Various accounts of the 1921 trade union debate are available in such works as: O. Anweiler The Soviets: The Russian Workers', Peasants' and Soldiers' Councils: 1905–1921, trans. R. Hein (New York: Random House-Pantheon, 1973), pp. 244–253; M. Dewar, Labour Policy in the U.S.S.R. (New York: Royal Institute of International Affairs, 1956), pp. 82–86; and, F. Kaplan, Bolshevik Ideology and the Ethics of Labor (New York: Philosophical Library 1968). For a recent Soviet discussion, see L. S. Leonova, N. V. Savinchenko, "X s"ezd RKP(b) i ego istoricheskoe znachenie," Vestnik Moskovskogo universiteta, seriia 8, istoriia, 1982, No. 1, 3–14. For further discussion of the concept of dual functioning trade unions, see Blair Ruble, "Dual Functioning Trade Unions in the U.S.S.R.," British Journal of Industrial Relations, vol. XVII, No. 2, 235–241.

Concern among East European and Soviet trade union officials over possible unions failures in the struggle with "bureaucratism" has been heightened by the emergence of the Solidarity unions in Poland. This anxiety has been perhaps most forthrightly expressed by the President of the Soviet-dominated World Federation of Trade Unions and Secretary-General of the Central Committee of Hungarian Trade Unions, Sandor Gaspar, in an interview for Hungarian television on February 6, 1982:

> One thing must be seen clearly: the trade union movement of the socialist countries has done a lot and earned historic merits during the past thirty years . . . However, the task is much more complicated and complex today than at the time of the struggle for power. This has been shown also by the events in Poland. Now we possess more historic experience, know clearly and see that the trade union movements of socialist countries do not have sufficient scope of authority, . . . lack an independent image, . . . in other words, if they only work on order, and their job is confined to the execution of a given policy and are not in a position to shape this policy, this will—or at least may—sooner or later lead to social conflict. This is historic experience. I repeat: the events in Poland also prove this.[24]

INTERNAL TRADE UNION ORGANIZATION

In order to fulfill their dual functions, Soviet trade unions organize themselves on the basis of the so-called production principle and the principle of democratic centralism. According to the first, all employees in a given economic sector can be members of the same union, regardless of profession.[25] At present, there are 31 such unions with over 130 million members (approximately 98 percent of the Soviet work force) and a combined annual budget of over 3 billion rubles (See Figure I).[26] According to the principle of democratic centralism, policies are viewed as having been democratically conceived in that rank-and-file union members may suggest policy alternatives and centrist in so far as central institutions dictate policy direction once priorities have been established.[27] These two organizational principles combine to create an extraordinarily complex hierarchy of intra-union committees and regional inter-union councils according to which each union official becomes subject to both individual branch unions and the regional inter-union councils (See Figure II).[28]

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[23] R. Z. Livshits, "Sovershenstvovanie khoziaistvennogo mekhanizma i voprosy trudovogo prava," Sovetskoe gosudarstvo i pravo, 1981, No. 10, 47–55.

[24] "Sandor Gaspar on Trade Unions under Socialism," in British Broadcasting Corporation, Summary of World Broadcasts, February 9, 1982 (EE/6949/A2/1).

[25] Ts.A. Iampol'skaia, "O sisteme profsoiuzov SSSR," in Ts.A. Iampol'skaia A.I. Tsepin (eds.), Pravovye aspekty deiatel'nosti profsoiuzov SSSR (Moscow: Nauka, 1973), pp. 41–93.

[26] In addition to workers and employees, union membership statistics include students at institutions of higher and specialized secondary education directly affiliated with industry.

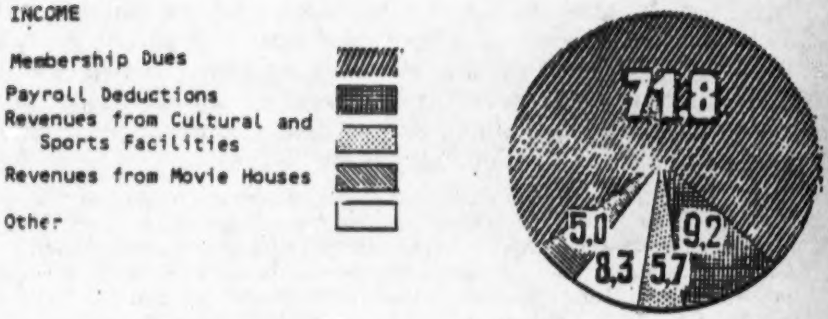
[27] V. Smoliarchuk, Prava profsoiuzov v regulirovanii trudovykh otnoshenii rabochikh i sluzhiashchikh (Moscow: Profizdat, 1973), pp. 5–11.

[28] L.M. Pavlova, A.S. Protopopov, "Profsoiuznoe dvizhenie v SSSR na etape razvitogo sotsializma," Istoriia SSSR, 1979, No. 4, p. 13.

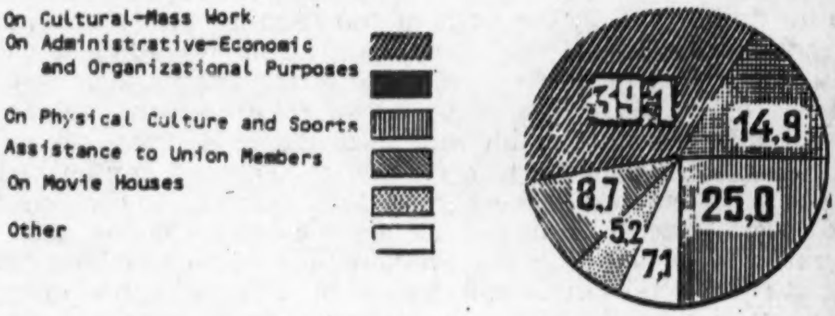
FIGURE I: STRUCTURE OF 1981 TRADE UNION BUDGET

(Total Income= 3,000,000,000 rubles)

INCOME



EXPENDITURES



SOURCE: TRUD, March 13, 1982, p. 2

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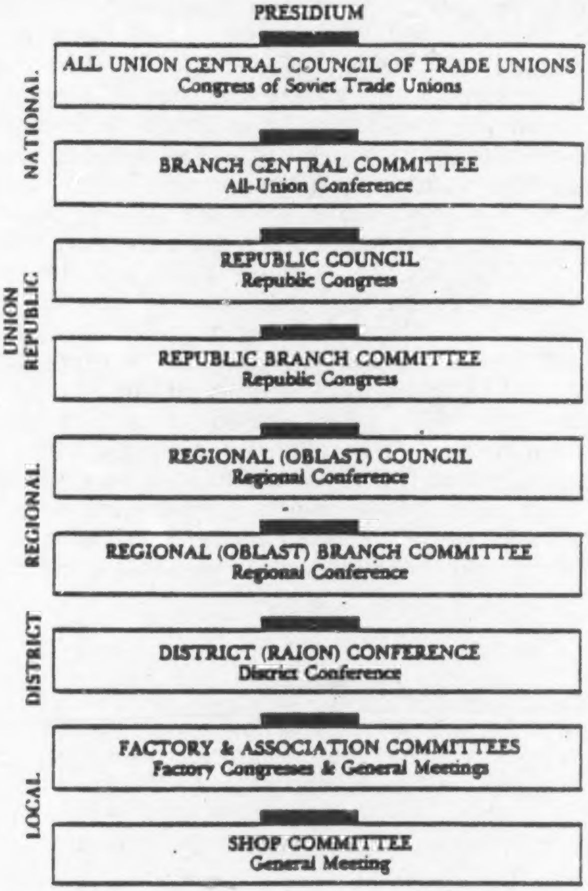
PRESIDIUM
ALL UNION CENTRAL COUNCIL OF TRADE UNIONS
Congress of Soviet Trade Unions
BRANCH CENTRAL COMMITTEE
All-Union Conference
REPUBLIC COUNCIL
Republic Congress
REPUBLIC BRANCH COMMITTEE
Republic Congress
REGIONAL (OBLAST) COUNCIL
Regional Conference
REGIONAL (OBLAST) BRANCH COMMITTEE
Regional Conference
DISTRICT (RAION) CONFERENCE
District Conference
FACTORY & ASSOCIATION COMMITTEES
Factory Congresses & General Meetings
SHOP COMMITTEE
General Meeting
NATIONAL
UNION REPUBLIC
REGIONAL
DISTRICT
LOCAL

Figure II. Soviet trade union organization.

Source: Blair A. Ruble, Soviet Trade Unions; Their Development in the 1970s (Cambridge: Cambridge University Press, 1981), p. 48.

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Precisely how Soviet trade unions have attempted to fulfill their assigned functions has evolved over the years. E. H. Carr once observed that Soviet labor relations theory is marked by a desire to integrate the unions into the workers' state, for "the organs of the workers and the organs of the workers' state could not go their separate ways." [29] During the 1920s, "not going their separate way" could still mean that union representatives defended the rights of workers against neglectful managers. Strikes occurred throughout much of the decade even at state operated enterprises.[30] Once the Communist Party and Soviet government launched the First Five Year Plan in 1929, the unions "turned their face towards production." By 1940, absenteeism and truancy had become criminal offenses, and those union officers who were reluctant to enforce the new regulations found themselves subject to prosecution.[31] The nadir of Soviet unionism probably came during the Second World War when union agencies simply ceased to exist in many regions. In 1944, V. V. Kuznetsov, currently the First Deputy Chairman of the Presidium of the USSR Supreme Soviet, assumed the AUCCTU chairmanship and launched a program of "normalization" within the unions.[32] Seven years later, criminal sanctions against labor discipline violators were reduced and, in 1956, removed altogether.[33]

LABOR DISCIPLINE AND CONDITIONS

Since the late 1950s, Soviet managers have been faced with a dilemma: no longer armed with harsh criminal sanctions, they have sought to motivate workers through material and psychic rewards. Yet, the Soviet economy has not produced adequate rewards to spur sufficiently higher levels of productivity. Rather, a new sort of freedom has developed in recent years, the "freedom not to work too hard." This indifferent attitude towards work among some Soviet citizens has developed at the same time that the need for increased labor productivity has become more pronounced. By the late 1970s, two differing views had emerged on how best to deal with the labor discipline "problem." On the one hand, there were those such as AUCCTU Chairman Shibaev who were arguing that only the creation of a "healthy moral-psychological climate" could ultimately increase productivity.[34] On the other, there were those such as Politburo member Arvid Pel'she who wrote of the need to "strengthen the individual responsibility of cadres for assigned work." [35] This discussion has become more polarized following the collapse of the existing industrial order in Poland.

The emphasis placed by Shibaev and others on psychological and social factors affecting working conditions reflects an interest among Soviet union officials and labor specialists in less punitive approaches to labor discipline. This interest is in part a result of the efforts of legal experts to apply sociological methodologies in their examination of labor law violations.[36] The findings of their research suggest that undisciplined behavior has social causes and can be ameliorated only by a healthy work environment. Hence, the scholars argue, any expenditure for improved "moral-psychological climates" may be offset by improved worker morale and increased productivity.[37]

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[29] E.H. Carr, "Marriage of Inconvenience," New York Review of Books, May 18, 1978, pp. 42-43.

[30] M McAuley, Labour Disputes in Soviet Russia, 1957-1965 (Oxford: Clarendon, 1969), pp. 9-39.

[31] S. Schwarz, Labor in the Soviet Union (New York: Praeger, 1952), pp. 100-115.

[32] For a discussion of the "normalization" process, see E. Morrell, "Communist Unionism: Organized Labor and the Soviet State," (Unpublished PhD dissertation, Harvard University, Cambridge, Mass., 1965), pp. 88-98.

[33] Ibid., pp. 103-108.

[34] "Vliiatel'naia sila Sovetskogo obshchestva;" Trud. June 20, 1978, p. 2.

[35] A. Pel'she, "O trebovatel'nosti i distsipline," Kommunist, 1980, No. 2, 19-32, p. 20.

This viewpioint gained wide acceptance in recent years and supports union efforts to upgrade working conditions. In 1978 an AUCCTU plenum examined poor attendance records and a high incidence of petty theft in the heavy machine construction industry and concluded by urging that the "socio-living conditions" of the industry's workers be improved.[38] Numerous senior Party leaders openly support attempts to improve working conditions as the most effective means for increasing industrial productivity. Brezhnev, for example, has reminded several Party and trade union convocations that factory trade union officials must protect workers against abusive managerial practices as part of their general effort to increase labor productivity.[39]

The creation of an appropriate "social climate" depends upon the ability of local union officials to guarantee safe working conditions. Yet, union performance in this area falls below even Soviet norms. A December, 1981 Trud editorial complained that some union leaders "forget" to enforce norms designed to protect workers.[40] A week later, AUCCTU Secretary A. Biriukova noted that conditions at "individual enterprises" did not meet "contemporary demands" concerning safety.[41] Then in January, 1982, the paper's editors urged up-coming inter-union regional conferences to consider this problem in their deliberations.[42]

Many speakers at the regional conferences, which convened to select delegates to the national trade union congress held in March, 1982 as well as to elect regional union officers, also spoke directly about union failures on the safety front. V. A. Fastova, a brigade leader from Volgogradgidrostroi, was joined by other speakers at the Volgograd Regional Inter-Union Conference in denouncing "passive" attitudes among enterprise union committees on the issue of safety.[43] Meanwhile, delegates to the Saratov Regional Inter-Union Conference complained of high levels of illness leading to an average daily loss of 43,000 work days in the Saratov

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[36] Such studies began to appear during the mid-1960s. It was not until after the appearance of A.A. Abramova, Distsiplina truda v SSSR (Moscow: Iurid. lit., 1969) and V. I. Nikitinskii, Effektivnost' norm trudovogo prava (Moscow: Iurid. lit., 1971) that this point of view began to find more general acceptance. Although neither work has been published in English, translations of similar studies are to be found in M. Yanowitch (ed.), Soviet Work Attitudes (White Plains: M.E. Sharpe, Inc., 1979.

[37] See, for example, V.N. Smirnov, Vnutrennii trudovoi rasporiadok na predpriiatii (Leningrad: LGU, 1980).

[38] "Vysokaia rol' trudovogo kollektiva," Trud, April 12, 1978, p. 3.

[39] "Krepit' trudovuiu distsiplinu "Pravda, October 28, 1974, p. 1; "V Tsentral'nom komitete KPSS," January 7, 1975, p. 1.

[40] "Vysokii dolg profsoiuznogo aktivista," Trud, December 18, 1981, p. 1.

[41] A. Biriukova, "Dlia blaga cheloveka," Trud, December 24, 1981, p. 2

[42] "Mezhsoiuznye konferentsii profsoiuzov," Trud, January [illegible] 1982, p.1

[43] O. Pozdniakova, "Volgogradskaia oblastnaia mezhsoiuznaia konferentsiia," Trud, January 31, 1982, p. 2.

Region alone,[44] and V. P. Mikita, director of the Omsknefteorgintez Industrial Association endorsed more forceful union defense of worker rights in his remarks at the Omsk Regional Inter-Union Conference.[45]

Reports from the republican inter-union congresses held during the same period indicate a similar level of concern. At the Turkmen Republican Trade Union Congress, speakers implied that many enterprise union officials enter into collusion with factory administrators on collective agreements with the result that working conditions in the republic have not necessarily been improving as they should have been.[46] Delegates to the Georgian Republican Trade Union Congress heard "sharp" criticisms leveled at several branch unions and industries for their inactivity on the safety issue. Specifically, speakers noted that conditions in handicraft industries had not significantly improved in over two decades.[47] Particularly outspoken discussion also took place at the Uzbek Republican Trade Union Congress, where complaints were voiced against a "formal" relationship on the part of some union officials towards labor safety.[48] Reports from the Uzbek Congress noted distressingly high levels of industrial trauma in the auto transport, tractor and agricultural machine construction, energy production as well as construction industries.

Comments such as these demonstrate an awareness that the conditions deemed necessary for improved productivity do not exist in many enterprises. In order to change this situation the unions can request the removal of particularly recalcitrant administrators. The data currently available on such action are incomplete, unsystematic and contradictory. In 1976, some 10,000 administrators were allegedly dismissed at union request; if true, it is a significant number.[49] Yet, AUCCTU Deputy Chairman V. Prokhorov has reported that 6,174 economic managers faced administrative sanctions in 1979, with only 146 actually being removed from office.[50] In 1980, according to a Moscow radio broadcast on December 26, 1981, 3,093 industrial managers were disciplined with 200 being removed from their posts.[51]

One of the few systematic reviews of labor safety indicates that the problem may have reached alarming proportions. A 1980 decree of the RSFSR Ministry of Education reported that a survey of only 5% of the establishments within that ministry's jurisdiction identified more than 30,000 labor safety violations during 1978 and 1979 alone. In 1979, 149 administrators at educational institutions were fined for such violations, as were 175 during the first half of

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[44] Iu. Kazakov, "Saratovskaia oblastnaia mezhsoiuznaia konferentsiia," Trud, February 3, 1982, p. 2.

[45] A. Pivovarov, "Omskaia oblastnaia mezhsoiuznaia konferentsiia," Trud, January 28, 1982, p. 2.

[46] B. Leonov, "S"ezd profsoiuzov Turkmenskoi SSR," Trud, January 23, 1982, p. 2.

[47] A. Dzaparidze, N. Kishkin, "S"ezd profsoiuzov Gruzinskoi SSR," Trud, January 30, 1982, p. 2.

[48] G. Kriuk, "S"ezd profsoiuzov Uzbekskoi SSR," Trud, February 6, 1982, p. 2.

[49] L.M. Pavlova, A. S. Protopopov "Profsoiuznoe dvizhenie," p. 12.

[50] "The Workers' Interests and the Trade Unions," Soviet Union, 1980, No. 10, pp. 8–9.

[51] "Facts and Figures on Trade Unions," in British Broadcasting Corporation, Summary of World Broadcasts, January 6, 1982 (SU/6920/B/2).

1980, with 21 officials being dismissed during the same 18 month period.[52]

Such a state of affairs in but a tiny proportion of enterprises from a non-industrial sector raises serious questions about the practical importance of the very real and profound changes taking place over the last three decades in attitudes regarding labor discipline and the work environment. Union officers as a group, together with many labor relations specialists and politicians have come to recognize that positive re-enforcement might motivate workers better than negative sanctions. Yet the new emphasis upon positive reward in management is heavily dependent upon the ability of union officials to upgrade the work environment. Here, Soviet performance falls far short of self-proclaimed goals.

Simultaneously with the apparent failure of a Human Relations approach to end labor discipline problems, some Soviet managers, politicians and labor specialists have begun to demand that increasingly severe sanctions be introduced at the work place. Such concerns are evident in a major decree of December 13, 1979 on labor discipline and labor turnover.[53]

The December 1979 decree of the Central Committee of the CPSU, the Presidium of the USSR Supreme Soviet, the USSR Council of Ministers and the AUCCTU "On the Further Strengthening of Labor Discipline and the Reduction of Labor Turnover in the National Economy" did not give Soviet workers a propitious start on the new decade. Citing the tremendous costs to the Soviet economy of unproductive behavior among Soviet workers, the decree initially calls to mind the more repressive labor policies of the past. Certainly, the decision to lengthen the required waiting period for leaving one's job following the submission of written notice from two weeks to one month can hardly be considered a liberalizing gesture.

Nevertheless, upon closer examination, the decree suggests that the trends towards less punitive approaches to labor discipline violations have left their unmistakable mark. Aside from the tightening of the regulations governing the submission of written notice, the measures taken or recommended by the Central Committee, the Supreme Soviet, the Council of Ministers, and the AUCCTU focus on rewards for good performance rather than punishment for bad. Even more in line with the emergent Human Relations approach, economic managers, Party and union officials, as well as municipal governments are chided for contributing to the poor performance of Soviet workers. Finally, the U.S.S.R. State Committee on Labor and Social Questions and the AUCCTU are to join with research institutes of the U.S.S.R. Academy of Sciences to encourage the systematic study and analysis of the effectiveness of various economic, social and legal measures that may be employed to strengthen labor discipline. It is precisely such study that led to the more sophisticated approaches to labor discipline problems in the first place, as well as to a fuller appreciation that union officials must be in a position to enforce labor safety norms in order to foster a proper social climate if productivity is ever to be consistantly and steadily increased.

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[52] "O sostoianii i merakh po dal'neishemu ulushcheniiu uslovii i okhrany truda v uchrezhdeniiakh posveshcheniia," in Sbornik prikazov i instruktsii Ministerstva prosveshcheniia RSFSR, 1981, No. 4, pp. 20–30.

[53] "V TsK KPSS, Prezidiume Verkhovnogo soveta SSSR, Sovete Ministrov SSSR i VTsSPS o dal'neishem ukreplenii trudovoi distsipliny i sokrashenii tekuchesti kadrov v narodnom khoziaistve" Trud, , January 12, 1980, pp. 1-2. For examples of accompanying commentary, see "Krepit' distsipliny truda," Trud, January 13, 1980, p. 1; and, "Smotr okhrana truda," Trud, January 20, 1980, p. 1.

The December, 1979 decree, then, represents a compromise of sorts. Advocates of less punitive approaches to labor discipline are able to point to the system of rewards contained in the final document; proponents of a harder line can choose to emphasize the extension of the waiting period to leave one's job from two weeks to a month. This resolution more-or-less represented the state of play on the eve of the August, 1980 strikes in Gdansk.

The precise significance attached to various components of the Solidarity movement in Poland by Soviet officials is difficult to assess. The degree to which the emergence of Solidarity reflects a breakdown in industrial relations became viewed by many Soviet citizens as apparent proof that the Poles "simply do not want to work." [54] This perception has undoubtedly influenced Soviet thinking about the nature of labor relations both in Poland and at home in the Soviet Union. While it is not possible to document a causal relationship between these two trends, it is quite apparent that the months following the beginning of the Solidarity movement in Poland witnessed a polarization in the on-going debate inside the Soviet Union over the appropriate shape of policy towards labor discipline. This growing rift can be seen in a survey of attitudes towards labor discipline published in the September 1981 issue of the Novosibirsk-based journal EKO—Ekonomika i organizatsiia promyshlennogo proizvodstva (EKO—Economics and Organization of Industrial Production).[55]

The EKO analysis is based upon the responses of some 200 factory administrators, academic specialists and workers throughout the Soviet Union, but primarily from Siberia and the Far East. The 200 respondents are self-selected in that the journal distributed more than 800 questionaires to subscribers and participants in management seminars in Vladivostok, Omsk, Cheliabinsk and Barnaul'. The survey was undertaken in early, 1980 (that is, before the first strikes in Gdansk) but the analysis of the data undoubtedly occurred after Solidarity had been organized in Poland.

The survey suggests that despite declining labor turnover rates and less worktime lost to non-work activities (both have significantly declined throughout the 1970s), many of the respondents perceived just the opposite. An underlying sense of unease over a lack of labor discipline is evident in many of the comments selected for publication. These sentiments appear to be more pronounced among workers who joined the labor force during the more orderly days of the post-War Stalinist labor regime.

In general, labor discipline appears to be viewed as a problem of youth and of the inability of existing educational programs to instill an appropriate attitude toward work. Alcohol, a decline in pride of workmanship, maladjustment of rural migrants to industrial life and a lack of knowledge of managerial science on the part of factory administrators are also mentioned as contributing factors. The general tenor of the responses, then, is not at variance with the position of various union and academic advocates of less punitive approaches to labor discipline violations. Moreover, many respondents noted that the current shortages in labor supply only contributed to the discipline problem. Implicit in this view is the notion that only the threat of unemployment would be sufficient to significantly reduce labor discipline violations. Finally, "less than a third of the respondents were inclined to transfer the reasons for a decline in labor discipline to the legal realm: laws are excessively soft."[56]

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[54] A recurring comment made to the author during a December, 1981 visit to Moscow and Leningrad.

[55] B P. Kutyrev, "Distsiplina truda v dinamike," Eko, 1981, No. 9, 17-45.

The demand for tougher laws is important even if only "less than a third" of the respondents were advocates of this position. The degree of emotional commitment among adherents to this position appears to be more intense than that of the vast majority putting forward more intricate and complex policy responses to labor discipline violations. More importantly, the sense of longing for a more orderly past can easily be fed by the apparently more widespread belief that the events in Poland took place because the Poles "simply do not want to work." The psychological support for a hard line on labor discipline at home provided by considerable unease over labor unrest abroad should not be discounted. The discussion over labor discipline policies has already become increasingly polarized before the strikes in Gdansk. The emergence of Solidarity in Poland only nurtured that process. It should be remembered, after all, that this growing dissonance over labor discipline policy occurs as economic pressure to increase labor productivity dramatically is mounting. It could well offer an area where a future Soviet leader might decide to make a mark.

LABOR UNREST AND DISSENT

Workers marching through the streets of scores of Polish cities raises the more ominous specter of Soviet workers taking to the street. The emergence of Solidarity in Poland inevitably leads observers both in the West and in the USSR to ask whether or not widespread labor unrest can take place in the Soviet factories as well.

One must remember in attempting to answer this question that Soviet workers have never been quiescent. The harsh disciplinary sanctions of the 1930s were imposed in part as a response to continuing worker turbulence, and they were lifted during the 1950s as part of a quest to find more flexible and effective means of dealing with such resistance. More recently, British political scientist Alex Pravda has examined the means by which workers express their discontent and has found remarkable variety in their activity.[57] Pravda consolidates a variety of legal, quasi-legal and illegal conduct in a study including labor turnover, labor discipline violations, letter writing and worker dissent. He thereby presents a broad range of options available to disgruntled Soviet workers.

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[56] Ibid., p. 31.

[57] A. Pravda, "Spontaneous Workers' Activity in the Soviet Union" in A. Kahan, B. Ruble eds.), Industrial Labor in the USSR, pp. 333-366.

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Even further beyond the edge of respectability, non-sanctioned demonstrations and disturbances occur in the Soviet Union. Riots in Novocherkassk are perhaps the best known. On June 1, 1962, an open revolt forced Red Army troops to recapture the local Communist Party headquarters from enraged workers.[58] Although reliable information provides an insufficient base from which to generalize, the infrequent accounts of strikes and labor protests in Moscow, Leningrad, Baku (Azerbaidzhan), Kamenets-Podol'sk (Ukraine), Temir-Tau (Kazakhstan), Chirchik (Uzbekistan) and Kaunas (Lithuania) follow a pattern: Soviet workers usually gain some limited immediate concessions as they did in Novocherkassk where shops reportedly overflowed with a variety of exotic foodstuffs. However, strike leaders there and elsewhere in the USSR are treated harshly and punished severely.

During the spring of 1980, several Western newspapers published unconfirmed reports of major wildcat strikes involving between 70,000 and 200,000 autoworkers at Togliatti and Gorky.[59] The Washington Post has published articles by its Moscow correspondent Kevin Klose on labor unrest in Soviet coal mining regions and, in January, 1981, The Christian Science Monitor reported that 2,000 workers at a tractor factory in Tartu, Estonia struck for two days in October, 1980 as a sign of unity with workers in Poland.[60] Soviet trade union officials vehemently deny such stories. Nevertheless, such recurring reports lend some additional credence to the notion that Soviet workers may not be passive at all.

By far the most celebrated manifestation of labor unrest came during the winter of 1977–1978 when a group led by Vladimir Klebanov attempted to form an independent trade union, the Association of Free Trade Unions.[61] Klebanov, it seems, had met other disgruntled citizens in the reception rooms of public officials in Moscow. Finding official channels closed to their complaints, 158 people from more than 42 cities signed a letter of protest. A half-dozen of these petitioners, including Klebanov, turned to Western journalists and called a newsconference to air their greviences. Several in the group were arrested for violations of Moscow residency laws, and Klebanov has been detained at a psychiatric hospital for "treatment." A year later, another attempt was made to form an autonomous trade union, the Free Interprofessional Association of Workers (SMOT). SMOT included as many as 100 members and appealed to the International Labor Organization for recognition before its leaders were incarcerated.

The Klebanov Group, SMOT, the workers of Tartu, Togliatti and Gorky outside officially sanctioned activities and letter writers and petitioners within the system create an environment in which labor relations and labor policy-making become more complex. Yet, conditions giving rise to industrial unrest on the scale of what has occurred in Poland do not appear to exist at this time. Incidents of serious worker protest in the Soviet Union remain both isolated and sporadic. Given the atomization of Soviet life and an extensive security apparatus more efficient than any found in Poland during the late 1970s, one can only assume that this state of affairs is not about to change. There are no autonomous social institutions in the Soviet Union as there are in Poland where the Roman Catholic Church provides a vital organizational and communications network outside the reach of the Communists Party. Moreover, Soviet workers seem to prefer to maximize their "freedom not to work too hard" rather than bringing down an entire political system around them. Finally, the revolt in Poland retains a highly nationalistic flavor. In the Soviet Union, national pride at least among Russian workers in the European regions of the USSR, would probably lead workers to oppose open protest rather than to favor it. The patriotism felt by Russian workers will most likely not lead to strikes; rather, one might expect ever more patience before what might become increasingly grim demands by the Soviet state.

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[58] A. Solzhenitsyn, The Gulag Archapelago (New York: Harper and Row, 1978), vol. 3, pp. 506–514.

[59] New York Times, June 14, 1980, p. 3.

[60] David K. Willis, "Kremlin Steps Up Its 4-year Assault on Baltic Dissidents," The Christian Science Monitor, January 5, 1981, p. 3; Kevin Klose, "Discontent Seething in Soviet Mines," The Washington Post, January 30, 1981, pp. Al, A18.

[61] Commission on Security and Cooperation in Europe, Implementation of the Final Act of the Conference on Security and Cooperation in Europe. Findings and Recommendations Five Years after Helsinki (Washington: Government Printing Office, 1980), pp. 98–102.

SUMMARY

The emergence of the Solidarity trade union movement in Poland has already had a discernable impact upon the course of trade union development in the USSR. The replacement of the rather non-descript AUCCTU Chairman Aleksei Shibaev with the younger and, by reputation at any rate, more dynamic Stepan Shalaev could well have been precipitated in part by concern over the image at home and abroad of Soviet trade unions in the wake of the suppression of the Solidarity movement in Poland. Open criticism of union inadequacies and public concern over mass/elite relations has increased. The on-going discussion over how best to deal with labor discipline violations has become more sharply drawn between those officials who speak of a need to improve the "moral-psychological climate" at the workplace and those who find current labor regulations "too soft." Finally some evidence points to the possible existence of small scale labor unrest in some Soviet factories.

The shape of Soviet trade union development and labor policy-making has been subtly but unmistakenly altered by the events in Poland. At the same time, the ever increasing necessity of improving labor productivity is raising the place of labor policies in the Soviet political agenda. And all of this is occurring as the leadership succession is about to begin.

In the short run, the polarization of views concerning labor discipline policies is likely to continue. Unease over a perceived decline in social order at the workplace (and beyond, for that matter) has become more pronounced in recent years. The emergence of the Solidarity Movement in Poland has only heightened such concern. The results of the survey conducted by EKO and various provisions of the December, 1979 resolution on labor discipline point to some support for a tightening of controls on workers. In a period of possible leadership struggle, advocacy of a law and order program for Soviet factories might appear to be the safest position a potential successor to Brezhnev can take.

In the long run, a return to more punitive approaches to labor relations would not solve the Soviet Union's current problems with labor productivity. Threats in and of themselves will not make workers in technologically intensive industries produce more. The problems confronting the Soviet economy in the 1980s and 1990s are not those faced by Stalin in the 1930s and 1940s. Lagging productivity in the USSR today is arguably a management problem and not a worker problem. The Soviet economy needs more imaginative and flexible use of new production techniques, energy and manpower resources. Ironically, one might even go so far as to suggest that the Soviet economy is constrained by too little (or, at least, not the right kind of) labor turnover. The emergence of a wide consensus on labor relations theory that is similar in some key respects to the Human Relations revolution in Western management theory attests to an evolving Soviet political economy. Soviet labor productivity can be increased; but not be reinstituting the harsh labor practices of the 1930s and 1940s. The national political leader who understands that this is the case will have the best prospect of leading a Soviet economy capable of meeting ever more ambitious productivity targets.

SOVIET LIVING STANDARDS: ACHIEVEMENTS AND PROSPECTS

By Gertrude E. Schroeder[*]

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SUMMARY

Since 1950, real per capita consumption in the U.S.S.R. has risen at an average annual rate of 3.4 percent, resulting in a near-tripling of the level of living of the average citizen. Nonetheless, the U.S.S.R. has made little progress toward its oft-proclaimed goal of catching up with capitalist countries in this area. In the late 1970s, Soviet per capita consumption was still only about one-third the U.S. level, less than half that in France and West Germany, and about two-thirds of that in Italy. Although small gains have been made in catching up with the U.S., the gaps with Western Europe and Japan have widened. In general, Soviet living standards remain drab and essentially primitive by Western standards and also compare unfavorably with much of Eastern Europe.

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The rate of growth of per capita consumption slowed markedly in the 1970s and was less than 2 percent in 1981 and under 1 percent in 1982. The falloff in growth occurred in all categories of consumption, but particularly in food supplies, as progress toward improving the quality of the diet was essentially halted in the latter half of the decade. Principally to blame was the near-stagnation of agricultural output and the consequent much reduced growth rates of production in the light and food processing industries. To shore up consumption the government sharply stepped up imports of food products and raw materials. Imports provided nearly all of the increased availability of farm products in 1976–81. The estimated share of imports of final consumer goods in total retail sales nearly doubled in the 1970s, thus helping to keep supplies of goods and services in line with the population's growing incomes.

The decade of the 1980s has begun most unauspiciously for consumers, with poor harvests in 1980 and 1981 and now again in 1982. Widespread disequillbria in consumer goods markets are much in evidence, especially for food. Because of severe constraints on overall economic growth, progress in raising living standards is bound to be very slow in the 1980s and could halt altogether, if industrial and agricultural performance continues to deteriorate. Although a new political leadership may try to do something to placate consumers, its options are few and fraught with conflicts. Consumer-related imports will face hard currency constraints and demands of other claimants. Substantial enlargement of legal private economic activity would run afoul of a deeply-held ideological aversion to such solutions. Fundamental systemic reforms, the only really effective option in the long run, not only would pose both ideological and political problems, but also would be fiercely resisted by the large bureaucracies that now run the economy.

I. Introduction

Thanks to somewhat altered priorities of post-Stalin political leaderships, Soviet consumers have scored impressive advances in levels of living. Since 1950, real per capita consumption has risen at an average annual rate of 3.4 percent, resulting in a near-tripling of the level of living of the average Soviet citizen. Large gains were made in all categories of consumption. As a result of the higher priority accorded to agriculture, per capita consumption of food doubled, and the quality of the diet improved greatly through increased provision of meat, dairy products, vegetables and fruits. Per capita consumption of clothing and related goods rose 4-fold, and their quality also improved substantially. From miniscule levels in 1950, availability of consumer durables expanded 14-fold, with a concomitant increase in quality, modernity and variety. Along with more goods, the Soviet people also were supplied with fast-growing supplies of personal services of all kinds—housing, utilities, public transportation and communications, personal services, and recreation. Finally, the government continued to increase expenditures on education and health care.

Despite these gains, the Soviet Union has made little progress toward its often-avowed goal to overtake and surpass capitalist countries in levels of living of the people. In the late 1970s, Soviet per capita consumption was still only about one-third of the U.S. level, less than half that in France and West Germany, and about two-thirds of per capita consumption in Italy.[1] Although small gains have been made since 1950 in catching up with the U.S., gaps with Western Europe have widened, and Japan has managed not only to catch up with the U.S.S.R., but to race far ahead. After more than 60 years of centrally planned socialism, Soviet living standards remain drab and essentially primitive by Western standards. Even in most of the socialist countries of Eastern Europe consumers are better off than they are in the U.S.S.R. With regard to two popular symbols of the good life—meat and cars—the Soviet people compare very unfavorably with both East and West. By Soviet measures, which overstate consumption relative to the U.S., per capita consumption of meat in 1980 was less than half that in the United States and was well below that in all East European countries, except possibly Romania.[2] In that year, there were 9 cars per 100 families in the U.S.S.R., compared with 17–38 in various East European countries in 1978.[3]

Against this general background, this paper examines the marked across-the-board slowdown in the improvement of living standards that has occurred in the 1970s and assesses the prospects for the 1980s. The first section describes the deteriorating situation in the 1970s, focusing on the growing problems in the industries supporting consumption. We also examine the role of imports in shoring up consumption. Concluding sections consider the provisions of the 11th Five-year plan (1981-85) related to living standards and assess the prospects for continued gains.

II. The Consumer Sector in the 1970's

A. THE RECORD FOR CONSUMPTION

As the data in Table 1 show, the past decade was one of slow gains for consumers, relative to the preceding two decades. The average annual growth of real per capita consumption in the 1970s (2.6 percent) was only half that achieved in 1966–70, and growth slowed to less than 2 percent in 1981. Although the falloff occurred in all major categories of consumption, most important and most dramatic was the reduction in the rate of improvement in food supplies. Since outlays on food, beverages and tobacco comprise more than half of Soviet household consumption, the snail's pace improvement in food supplies during the past decade undoubtedly was felt most acutely by the population. Some gains in per capita consumption of quality foods, notably meat, occurred in the first half of the decade, but no progress was made during 1976–81. During the past three years there have been widespread reports of local shortages of food, lengthening queues, rising prices in collective farm markets,[4] sporadic local rationing, and much more reliance on the distribution of food through special channels rather than through retail outlets. The government's unwillingness to raise state store prices for meat and milk products, coupled with rising incomes, exacerbated the shortages. During the 1970s, per capita disposable money incomes increased at an average annual rate of 4.6 percent.

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[1] Full details of these comparisons are given in Gertrude E. Schroeder and Imogene Edwards, Consumption in the USSR: An International Comparison, US Congress, Joint Economic Committee, Washington, 1981. The numbers given in the text reflect an updating by the author.

[2] Comparisons for socialist countries are given in Statisticheskii ezhegodnik stran-chlenov Soveta Ekonomichieskoi Vzaimopomoshchi, Moscow, 1981, p. 55. In 1978, per capita consumption of meat in Romania was 55 kg., compared with 57 in the USSR. G. A. Yaremenko, Raspredelenie i potreblenie v sotsialisticheskikh stranakh, Moscow, 1981, p. 33.

[3] Ibid, p. 38. Politichekoe samoobrazovanie, No. 6, 1981, p. 25.

TABLE 1.—AVERAGE ANNUAL RATES OF GROWTH IN CONSUMPTION PER CAPITA IN THE U.S.S.R., 1965–81

	1966–70	1971–75	1976–80	1979	1980	1981
Total consumption	5.1	2.8	2.4	2.3	2.9	1.9
Goods	5.4	2.8	2.3	2.3	3.0	2.0
Food	4.3	1.6	1.3	1.5	1.8	0.7
Soft goods	7.1	3.0	3.1	3.5	3.7	2.4
Durables	9.1	10.0	5.4	3.2	6.7	6.4
Services	4.3	3.0	2.4	2.5	2.5	1.8
Personal	5.8	4.6	3.4	2.6	2.6	2.1
Education	2.9	1.4	1.6	1.2	1.7	0.6
Health	3.2	1.4	1.1	0.7	0.3	−.1

Source: Gertrude E. Schroeder and M. Elizabeth Denton, An Index of Consumption in the USSR, in U.S.S.R.: Measures of Economic Growth and Development, 1950–1980, U.S. Congress, Joint Economic Committee, Washington, U.S. Government Printing Office, 1982. This source gives data for 1965–80. Growth rates shown there for 1979 and 1980 were revised and those for 1981 estimated using similar methodologies.

Growth rates for clothing, footwear and related soft goods also slowed markedly, and the campaign to improve their quality and variety seemed to be producing few results. Although real per capita expenditures on consumer durables expanded far more rapidly than any other category, it, too, shared in the overall slowdown. The growth of durables during 1971–75 was dominated by the burgeoning supplies of automobiles being turned out by the huge Tol'yatti plant purchased from the West in the late 1960s. After 1975, growth rates for production of cars leveled off, and those for other major durables also slowed because of saturation of the market with old models at prevailing prices and because of difficulties that producers had in shifting to models of better design and quality.

Outlays on consumer durables make up only one-eighth of total household outlays in the U.S.S.R. Per capita expenditures amount to less than one-seventh of those of consumers in the U.S. Nonetheless, ownership of these symbols of the modern age had become widespread, both in urban and in rural areas. At the end of 1980, 85 percent of all Soviet families had radios, 83 percent had television sets, 86 percent had refrigerators, and 70 percent had washing machines; only 9 percent owned a car. The corresponding percentages in 1970 are 72, 51, 32, 52, and 2. Despite much progress, ownership of household appliances remains far below levels prevailing in the West and most of Eastern Europe, and also well below the "rational" consumption norms (objectives) used in long-range planning of the population's living standards. With respect to both soft goods and durables, consumer markets continued to be characterized throughout the decade by random shortages and surpluses, innumerable consumer complaints about poor quality, periodic inventory pileups of unsalable goods and sales at heavily discounted prices, substantial annual budget subsidies to cover the costs, and ubiquitous black markets in coveted goods. The prevalence of these phenomena finally led the government in the late 1970s to raise prices sharply for many luxuries and other goods in high demand, including automobiles. The price of gasoline was doubled as a fuel conservation measure.

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[4] Prices in collective farm markets in Moscow more than doubled during the 1970s.

The rate of improvement in services per capita also fell markedly, both for paid services purchased by households and for health and education services provided without direct charge by the government. Growth rates of all of the major categories of personal services fell, particularly during 1976–81. The slowest gains were made in housing, which in 1981 still did not meet the minimum standard for health and decency set by the government in 1928 ($9m^2$ of living space per capita in urban areas). One urban family out of five still had to share kitchen and bath facilities with other families.[5] Probably the most problem-ridden sector was that concerned with providing repair and personal care services to the population. After virtually ignoring the sector for decades, the government made a big push to open up state shops in the latter 1960s. Expansion slowed in the 1970s, and rapidly growing proportions of these services, particularly repair services, were being supplied to state enterprises rather than to the population.[6] Complaints about the non-availability and poor quality of these services are comonplace in the press, as are reports of private providers rushing in to help meet the growing demand arising from urbanization, higher incomes and widespread ownership of durables. The situation seems to be especially bad with regard to repair and servicing of cars. A Soviet source states that state facilities are sufficient to handle only 38 percent of cars in need of repair.[7] Private purveyors, or owners themselves, service 6 out of every 10 cars.[8]

B. PERFORMANCE OF SECTORS SUPPORTING SUPPLIES OF GOODS

Food, clothing, and related soft goods make up over three-fourths of total household expenditures on consumption. The very slow growth of per capita consumption of these goods (less than 2 percent annually) stems directly from the sharply reduced growth rates of agricultural output and output in the light and food processing industries. Since the bulk of their raw materials consists of crop and livestock products, the performance of the food and light industries is directly affected by what happens to farm output.

1. Agriculture

The performance of Soviet agriculture in the 1970s was the worst in postwar history, with the sector virtually stagnating. Poor harvests were experienced in 1972, 1975, 1979, 1980 and 1981. Total farm output in 1971–75 was 11.7 percent above the total produced in 1966–70, but the total produced in 1976–80 was only 8.4 percent above that in 1971–75. Output declined by 6.3 percent in 1979 and by 3.2 percent in 1980 and rose only 0.3 percent in 1981. Although poor weather was partly to blame, the Soviets also were unable to raise productivity despite allocation of massive amounts of investment (over one fifth of the total in the 1970s), which more than doubled the total capital stock, and despite an increase of more than 50 percent in average agricultural wages. In the case of the population's food consumption, agricultural shortfalls constrained supplies of fresh produce as well as raw material supplies needed to produce processed foods, which form a rising share of total food consumption. Agricultural shortfalls also played a role in the reduced performance of the textile and clothing industries.

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[5] Voprosy ekonomiki, No. 5, 1981, pp. 12–13.

[6] Ekonomika i organizatsiia promyshlennogo proizvostva, No. 8, August 1981, pp. 41–47.

[7] Sovetskaia Rossiia, August 7, 1981.

[8] Ibid, October 17, 1981.

2. Food processing

The data in Table 2 show the sharply reduced growth rates in the food processing industries, particularly during 1976–80. Since roughly 70–75 percent of the raw materials for these industries comes from agriculture, either directly or indirectly, shortage of raw materials undoubtedly was the main reason for the falloff in growth rates in food processing, particularly meat and dairy products. Wildly fluctuating and generally declining sugar beet and oil crops created severe problems in sugar refining and vegetable oil production. Sharply reduced growth in the fish branch reflects a drop in the Soviet ocean fish catch in 1976–80, resulting mainly from the actions of Western governments in excluding foreign fishing vessels from waters within 200 miles of their coasts. The beverage industries were affected by shortages of raw materials and by the government's efforts to restrict production of hard liquor. Finally, in addition to being plagued with quantitative shortages, several food processing branches had to cope with poor and even deteriorating quality of raw materials. Numerous Soviet sources including Brezhnev, fulminate about the enormous losses and damage to fruits, vegetables and potatoes in their journey from farm to market.[9] According to a variety of evidence, the sugar content of beets and of grapes has been declining, as has the amount of oil in oilseeds and the amount of starch in potatoes.[10] Even the quality of tea is falling.[11]

TABLE 2.—AVERAGE ANNUAL RATES OF GROWTH OF OUTPUT IN CONSUMER GOODS INDUSTRIES, 1965–81

	1966–70	1971–75	1976–80	1979	1980	1981
Food processing	5.9	3.9	1.1	3.2	−1.4	1.7
Fish	6.8	7.8	2.3	6.2	−1.2	3.4
Meat	6.7	7.3	−.8	.5	−4.0	2.0
Dairy products	9.8	4.0	1.2	.4	1.0	0.1
Sugar	−1.5	.4	−.5	−12.5	−4.8	6.0
Flour	3.4	.4	2.0	4.0	1.9	0.6
Bread	1.2	1.8	1.5	.5	2.4	0.8

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[9] Ekonomika i organizatsiia promyshlennogo proizvodstva, No. 10, October 1981, pp. 117–130; and S. N. Bobylev and A. Sh. Khodzhayev, Problemy sokhranosti sel'skokhoziaistyennoi produktsii, Moscow, 1981, pp. 37–46.

[10] See for example, L. A. Kostin, Proizvodstvo tovarov narodnogo potrebleniia, Moscow, 1980; pp. 119, 137. Sakharnaia promyshlennost', No. 7, 1981, p. 2.

[11] Zaria vostoka, April 16, 1982.

TABLE 2.—AVERAGE ANNUAL RATES OF GROWTH OF OUTPUT IN CONSUMER GOODS INDUSTRIES, 1965–81—Continued

	1966–70	1971–75	1976–80	1979	1980	1981
Confectioneries	4.6	2.3	3.5	1.9	2.4	2.3
Vegetable oil	−.1	3.5	−5.2	−5.7	−6.5	−2.6
Fruits and vegetables	7.9	6.6	−.7	9.0	−6.0	5.5
Beverages and tobacco	8.5	2.7	1.8	10.1	6.0	4.9
Light industry	7.2	2.7	2.7	1.8	2.9	2.5
Textiles	4.8	2.7	1.8	.04	.8	−1.3
Sewn goods	12.2	3.5	4.5	3.7	3.9	3.4
Leather, fur and footwear	5.3	.6	.7	−.6	.5	−.7

Source: Ray Converse, An Index of Industrial Production in the U.S.S.R., in U.S.S.R.: Measures of Economic Growth and Development, 1950–1980, U.S. Congress, Joint Economic Committee, Washington, U.S. Government Printing Office, 1982. Growth rates for 1980 and 1981 were estimated using the same methodology as was used there for the period 1950–1979.

Problems with raw materials supplies, however, were not the only reason for the falloff in performance of the food processing industries in the 1970s. The growth of the sector's capital stock slowed markedly as a result of a reduction in its investment priority: its share of industial investment dropped from 8.8 percent in the 1960s to 6.9 percent in 1971–75 and to 6.1 percent in 1976-80.[12] Moreover, by 1980 four-fifths of investment was being used to reequip and modernize existing facilities, rather than building new ones, as had been done previously for the most part. As a consequence, introduction of new capacities was sharply curtailed, and current production in old plants evidently was disrupted in the process. The branch evidently had low priority in implementing its investment plans, for the volume of unfinished construction shot up from 45 to 80 percent of total investment during the decade. Most new equipment is produced domestically, and complaints about its availability and quality are legion. Soviet sources state, for example, that 45–50 percent of domestically produced machinery does not meet modern standards and that even some imported equipment is obsolete.[13] Finally, the food processing branches continued to be plagued with problems in attracting and retaining skilled labor. Wages are the next to lowest of the major branches of industry, manual labor is nearly universal in auxiliary operations, work is seasonal, shift operations are prevalent, and labor turnover is high.

3. Light industries

The factors accounting for the substantially worsened performance of the light industries (mainly textiles, clothing and footwear) are similar to those described for the food processing branches. The bulk of raw materials for light industry comes from agriculture and from the chemical industry. Shortages of raw materials per se, however, seem to have been less important in explaining the slow growth in these industries than in the food processing branches. Both cotton and wool production expanded substantially during the 1970s, although flax output declined sharply as did growth rates for synthetic fibers. The quality of cotton fibers reportedly has been deteriorating, however, and poor quality and shortages of hides for leather were frequently cited. The sector's problems seem to lie more in a reduction of its priority, as reflected in its share in industrial investment, and in a radical shift in investment strategy. In the 1960s, new investment was channeled mainly into building new plants; in the 1970s it was targeted toward renovating existing plants. The share of the latter in total investment rose from 40 percent in 1970 to 75 percent in 1980. This shift was accompanied by a sharp reduction in addition of new capacities. Rather than being largely capacity-enhancing, investment in the 1970s evidently was directed toward improving product quality, saving labor, reducing other costs, improving working conditions, and generally modernizing an aged capital stock.[14] If the aim was greater productivity, the strategy failed, for factor productivity essentially stagnated in light industry as a whole and declined in the textile and footwear branches. One factor may have been the poor quality of new equipment, only 40–50 percent of which is said to meet modern standards. Finally, the light industries were plagued with growing labor problems during the decade. Wages are lowest among major industry branches, the bulk of workers are women, and working conditions are arduous, dirty, and stressful. As a consequence, labor turnover is high, and workers are reluctant to enter the industry.[15]

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[12] Data relating to investment are taken or derived from Narodnoe khoziaistvo SSSR, 1980, pp. 330, 338–339, 345 and similar tables in editions for earlier years.

[13] Voprosy ekonomiki, No. 4, 1979, pp. 85–93. Bobylev and Khodzhaev, op. cit., pp. 57, 63.

4. Consumer durables

The drop in the rate of growth of purchases of durables resulted in part from a smaller decline in the growth of output and some apparent saturation of demand for many common durables in the quality and models being supplied. During 1976–80 the production of motorcycles, radios, television sets, refrigerators, and vacuum cleaners essentially leveled off, after many years of rapid growth from low levels, and output of sewing machines declined. Output of passenger cars rose only 10.5 percent during 1976–80, although demand remained high. The growth of furniture production slowed markedly, evidently as a result of a variety of difficulties with assorted raw materials.

Production of consumer durables, except for automobile, is organized in a most haphazard manner. Most durables are produced as sidelines items by plants in heavy industry. Efforts to coordinate and standardize their production by assigning responsibility for a given product to a particular ministry have been largely ineffective.[16] Furniture is produced in 35 branches of industry, and coordination by the Ministry of the Forests Products Industry has proved nigh impossible.[17] The two head ministries assigned to manage production of household appliances account for only 53 percent of their output; the rest is scattered among scores of plants of many other ministries.[18] A wide variety of models of appliances are put out by the various ministeries, seriously complicating the problem of supplying spare parts and the efforts to centralize repair in large industrial-type service facilities. Thus, in 1980, various ministeries produced 89 models of bicycles, 56 types of television sets, 38 models of tape recorders and 34 types of electric shavers.[19] Despite a decade-long campaign to phase out obsolete models and produce new ones, only 0.1 percent of washing machines produced in 1980 were automatic, and only 2 percent of refrigerators had capacities of 200 liters (about 7 cubic feet) or more.[20] In contrast, the shift to color television production has been relatively successful; output of color sets comprised 30 percent of the total in 1980. Despite several decrees and much rhetoric to the contrary, a mass of press reporting indicates that production of durables and the thousands of odds and ends associated with their use does not really have high priority in the minds of either producers, ministries, or Gosplan.

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[14] It is reported, for example, that over half of the textile plants in the RSFSR were built before the 1917 revolution Ekonomicheskaia gazeta, No. 8, February 1982, p. 2.

[15] Typical of the press discussion of labor problems besetting light and food industries is Planovoe khoziaistvo, No. 12, 1981, pp. 44–53: Bobylev and Khodzhaev, op. cit, p. 30–35. The critical labor situation was the subject of a recent Party-Government Resolution. Pravda, March 31, 1982.

[16] Sovetskaia torgovlia, March 19, 1981.

[17] L. A. Kostin, op. cit., p. 198. Ekonomicheskaia gazeta, No. 36, September 1979, pp. 1–2. Nearly 15 percent of total furniture output is defective, according to Planovoe khoziaistvo, No. 5, 1981, p. 94.

C. PERFORMANCE OF THE SERVICES SECTORS

An important reason for the falloff in growth rates for consumer-oriented services is the traditional reluctance of the government to allocate investment to them, resulting in large backlogs of neglect, and the reduction of their relative priority in the 1970s. Thus, the share of so-called "non-productive" investment (mainly, pertaining to consumer services) in total new fixed investment fell from 35.1 percent in 1960 to 30.4 percent in 1970 and to 25.9 percent in 1980. The share of housing investment in total investment has declined in each of the past 5 five-year plans—from 23.5 percent in 1956–60 to 13.6 percent in 1976–80. The share of all services but housing (but including science, finance, and government) fell from 14.5 percent in the 1960s to 12.3 percent in the 1970s. Investment in trade facilities both wholesale and retail was a miniscule 3 percent of the total in the 1960s and its share fell to 2.5 percent in the 1970s.[21]

Aside from housing, probably the most backward of the services sectors, relative to the West, are those concerned with retail distribution and with provision of a variety of repair and personal care services. Indeed, Gur Ofer, relying on employment data, has found a large trade and services "gap" in the U.S.S.R. in the early 1960s relative to countries at similar levels of development.[22] Despite rapid expansion of these facilities, the "gap" has been reduced very little if any in the past two decades. In 1977, for example, the U.S.S.R. employed about one eighth of its labor force in trade and personal services, compared with about one-third in the U.S. In that year the U.S.S.R. had 695,600 retail outlets, a third of them classified as palatki (stalls, stands, kiosks, many merely seasonal), 286,000 dining facilities (only 28 percent of which were open to the general public), and 263,500 service enterprises. The United States in that year has 1.5 million retail outlets, 368,000 eating and drinking places and 875,000 household service establishments (not including individual proprietors without formal payrolls) to serve a populace one-fifth smaller. While a comparison with the U.S. may not seem entirely appropriate, it does provide a sense of the size of the quantitative lags. Truly enormous amounts of investment would be needed to modernize these sectors.

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[18] L. A. Kostin, op. cit., p. 192.

[19] Voprosy ekonomiki, No. 7, 1981, p. 85.

[20] Ekonomicheskaia gazeta, No. 44, October 1981, p. 2.

[21] Investment data were derived from Narkhoz SSSR and CMEA, Statisticheskii ezhegodnik for various years.

[22] Gur Ofer, The Service Sector in Soviet Economic Growth, Cambridge, Harvard University Press, 1973, pp. 76–126.

D. THE CONTRIBUTION OF IMPORTS TO CONSUMPTION

During the 1970s, imports made a substantial and growing contribution to consumption in real terms and also played a considerable role in the government's effort to match growing money incomes of the population with corresponding flows of goods and services. Imports also contributed indirectly to consumption through rapidly growing supplies of raw materials and machinery for agriculture, the light and food processing branches, and other consumer goods industries. Tables 3 and 4 assemble data on Soviet imports of consumer-related products. These data are based on the relevant commodity data published in the Soviet foreign trade handbooks; because the published data giving commodity composition and also geographical breakdowns are incomplete, the figures cited should be regarded as minimum values or quantities, but probably not grossly understated. The incompleteness of the data should not distort the trends.

TABLE 3.—IMPORTS OF CONSUMER-RELATED GOODS, 1970, 1975, AND 1980

Product (units)	1970	1975	1980	1980 as percent of 1970
1. Foods:				
Meat (th m tons)	165	515	821	498
Fish (th m tons)	38	28	182	479
Butter (th m tons)	2	12	249	1,245
Milk products (th m tons)	41	35	89	217
Vegetable oil (th m tons)	65	61	357	549
Eggs (mil units)	602	767	737	122
Canned vegetables (th std cans)	623	805	1,052	169
Fresh vegetables (th m tons)	163	144	133	82
Fresh fruit(th m tons)	679	860	995	147
Dried fruits (th m tons)	129	118	130	101
Processed fruits (th m tons)	207	177	227	110
Nuts (th m tons)	39	60	49	126
Sugar (refined) (th m tons)	3	4	1,056	350
Flour (th m tons)	259	339	959	370
Rice (th m tons)	(1)	279	694	....
Coffee, tea, cocoa (th m tons)	177	296	246	13
Cigarettes (mil units)	42	53	58	138
Beer (mil dkl)	2	4	8	400
2. Nonfood goods:				
Fabrics (mil m)	254	366	408	161
Leather shores (mil pairs)	61	68	66	10
Rugs (mil m^2)	61	68	66	108
3. Raw Materials:				
Grain (mil m tons)	2	16	28	1,400
Sugar, raw (mil m tons)	(1)	3	4	....
Cattle (th m tons live weight)	75	260	(1)	....
Natural fibers (th m tons)	307	172	130	42

TABLE 3.—IMPORTS OF CONSUMER-RELATED GOODS, 1970, 1975, AND 1980—Continued

Product (units)	1970	1975	1980	1980 as percent of 1970
Wool (th m tons)	83	109	124	149
Yarn semi-fabricates (th m tons)	56	68	111	198

[1] Not available.

Source: Vneshnaia torgovlia SSSR, 1970, 1976, and 1980. Imports of grain in 1980, not published by the U.S.S.R., were estimated by the Economic Research Service, U.S. Department of Agriculture (USSR: Review of Agriculture in 1981 and Outlook for 1982, p. 30).

TABLE 4.—IMPORTS OF FINAL CONSUMER GOODS IN DOMESTIC PRICES, 1970, 1975, AND 1980

	Imports in foreign trade prices (billion current rubles)			Conversion coefficients [1]	Imports in domestic prices (billion current rubles)			Percent of retail sales		
	1970	1975	1980		1970	1975	1980	1970	1975	1980
Total consumer goods	2.947	5.579	9.826	3.92	11.564	21.664	37.652	7.5	10.3	13.9
Total food	1.035	2.152	4.458	3.43	3.455	7.011	14.376	3.9	6.0	10.1
Meat and dairy products	.134	.431	1.301	3.30	.470	1.575	4.375	1.8	4.3	10.3
All other foods	.415	.761	1.845	3.59	1.492	2.620	6.153	4.3	6.1	11.9
Beverages and tobacco	.486	.960	1.312	2.93	1.425	2.815	3.849	5.2	7.6	8.1
Total nonfood	1.912	3.427	5.368	4.24	8.109	14.653	23.282	12.2	15.6	18.1
Fabrics, clothing, shoes	1.134	2.092	3.039	5.57	6.319	11.404	16.474	17.3	24.2	27.7
Durables	.198	.373	1.048	3.20	.631	1.324	4.247	4.4	5.0	10.1
All other	.580	.962	1.280	2.00	1.159	1.924	2.561	7.5	9.5	9.4

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[1] Coefficients shown for individual commodity groups are those obtained by weighting with the structure of imports in 1970. The coefficients used to convert values for groups of goods in 1975 and 1980 differ a little because of changes in the structure of imports. Coefficients used to convert values in foreign trade prices to values in domestic (retail) prices are given by product in Vladimir G. Treml and Barry L. Kostinsky, The Domestic Value of Soviet Foreign Trade Exports and Imports in 1972. U.S. Bureau of the Census, Foreign Demographic Analysis Division, Foreign Economic Report, No. 20, 1982. Retail trade values underlying the percentages given above are taken from Narkhoz 1980, pp. 429–430.

During the 1970s, consumer-related imports comprised well over two-fifths of total Soviet imports; their share was 45 percent in 1970 and 43 percent in 1980. Over half of the total consisted of final consumer goods; their share was 52 percent in 1970 and 51 percent in 1980. Dominated by fluctuating purchases of grain and raw sugar, the share of raw materials for consumer related industries varied from a low of 22 percent in 1971 to a high of 40 percent in 1975. Purchases of machinery for such industries made up 11 to 14 percent of the total throughout the period. During the decade, the share imported from other Communist countries fell from 65 percent to 58 percent, while that of the developed West rose from 16 percent to 24 percent. The proportion of all hard currency imports in total imports of consumer-related goods ranged from 28 percent to 41 percent in various years; more complete data probably would indicate higher shares.[23] In nominal terms, the value of consumer-related imports more than tripled, and perhaps may have doubled in real terms.

1. Imports of final consumer goods

During the 1970s, the Soviet Union imported a wide variety of final consumer goods, most or perhaps all of which were sold directly to consumers through retail outlets. The total value of such goods rose 3.3 times in current prices and by two-thirds or more in real terms. Food, beverages and tobacco made up 45 percent of the total in 1980, compared with 35 percent in 1970. Although a suitable deflator was hard to come by, it is clear that imports of food products rose far more rapidly than both domestic production and deflated retail sales and therefore made a growing contribution to the gains in real per capita consumption of food during the decade. Data in physical units are given in Table 3; the data relate to total imports, not net imports, since the main purpose is to provide an idea of the real increases that underlie the value data given in Table 4. For most products, exports are quite small relative to imports. In 1980, for example, consumer goods and raw materials for food processing comprised 4 percent of total exports and 36 percent of imports. As the data show, imports of most of the quality foods increased sharply during the second half of the decade, as the government sought to make up for shortfalls in domestic farm output and the concomitant near stagnation in the food processing industries. Imports provided nearly all of the increase in real per capita availability of farm products in 1976–81. During 1976–80, for example, the USSR imported 2.6 million tons of meat and meat products and added another 980 thousand tons in 1981. Greatly increased quantities of fish, dairy products, vegetable oil, sugar, flour, and rice also were purchased during the latter half of the 1970s. From the few quantitative series available, it appears that imports of non-food goods also rose substantially in real terms; they rose 2.8 times in current values. The bulk of them consists of fabrics, clothing, footwear and related goods; imports in real terms probably also rose faster than both domestic output of light industry and deflated retail sales. The U.S.S.R. imports relatively few consumer durables, the principal ones being rugs and furniture.

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[23] In a Soviet book published in 1977 the author states that "in recent years" imports of consumer goods and related raw materials represent around [illegible]-fifths of hard currency receipts. V.I. Klochek and B.M. Pichugin, Vneshnaia torgovlia SSSR: itogi devyatoi piatiletki i perspektivy, Moscow, 1977, p. 14.

Besides adding significantly to quantitative availabilities, especially of food products, imports have helped the government to keep available supplies of goods and services in balance with the population's purchasing power. During the 1970s, total disposable money incomes increased by 71 percent, and retail sales, which account for the bulk of household expenditures on goods and personal and repair services, rose by about the same percentage. Since domestic agricultural output essentially stagnated and the output of the light and food processing industries grew very slowly, imports have been used to help fill the gap. Calculations of their possible addition to the value of retail sales are shown in Table 4.

The table gives the total values of imported consumer goods in 1970, 1975, and 1980 as reported in Soviet foreign trade handbooks. These goods are then revalued in domestic retail prices using conversion coefficients estimated for 1972 by Treml and Kostinsky from a variety of Soviet sources; for most non-food goods, they are taken or derived from a study by R. A. Lokshin.[24] The results, grouped into major categories, are then expressed as percentages of reported retail sales. The use of constant conversion coefficients assumes that increases in world prices are reflected in domestic retail prices. Judging from a variety of evidence, this seems to be Soviet policy for all goods except homogeneous products such as sugar, flour, and butter, for which domestic prices greatly exceed world prices anyway. Adjusting the coefficients for such products has a minor affect on the final results.

There are a number of other uncertainties in these calculations, which are presented here as reasonable approximations and fairly accurate descriptions of trends, not as definitive values. The major uncertainties are: (1) the published foreign trade data in commodity and geographical detail are known to be incomplete; (2) estimated conversion coefficients are highly aggregated; (3) assignment of coefficients to particular products necessarily was somewhat arbitrary; (4) the available coefficients relate to the early to mid-1970s; it is not known to what extent the coefficients have been revised; (5) in the calculations the assumption was made that all of the reported imports were sold in retail trade; however, some may have been sold directly to processors or to budget institutions.

Despite these uncertainties, the results agree reasonable well with a variety of evidence given in the Lokshin study and elsewhere. On balance, the values in domestic prices for food products are thought to be near the mark, but those for non-food goods may be somewhat high. Thus, our average conversion coefficient for the latter in 1980 in 4.6. A Soviet source states that in 1979 imports of such goods from CMEA countries made up over 5 percent of total retail trade, thus implying a conversion ratio of 4.0.[25] Another

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[24] Vladimir G. Treml and Barry L. Kostinsky, The Domestic Value of Soviet Foreign Trade Exports and Imports in 1972, U.S. Bureau of the Census, Foreign Demographic Analysis Division, Foreign Economic Report No. 20, 1982. R. A. Lokshin, Spros, proizvodstvo, torgovlia, Moscow, 1975, Chapter III.

[25] Voprosy ekonomiki, No. 4, 1981, p. 109.

Soviet source, published in 1977, states that "in recent years" imports have constituted more than 10 percent of total retail trade:[26] Our calculation was 10.3 percent in 1975. Soviet sources also state that in 1972 the value of imports in domestic prices was double (2.2 times) their value in foreign trade prices[27] and that income from foreign trade made up over 10 percent of total budget revenue.[28] Since at least two-fifths of Soviet imports evidently consist of goods (mainly machinery) whose foreign trade values are also, on average, their domestic price values, it is clear that, on the average, imports of goods and raw materials related to consumption are priced at least 3 to 4 times their foreign trade cost, and that such price differentials (after deducting distribution costs) provide most of the rapidly growing budget income from foreign trade, which likely exceeded 30 billion rubles in 1980. In effect, such revenues are a levy on consumption analogous to the turnover tax.[29]

With these considerations in mind, we turn to the data shown in Table 4. Imports of final consumer goods more than tripled during the 1970s, rising much faster than total retail trade, so that their share nearly doubled. Retail sales actually rose 5.7 percent annually during the 1970s; without imports they would have risen 5.0 percent annualy. The share of imports rose especially fast for foods, notably meat and dairy products. In 1980, imports made up over a tenth of all retail sales of those products and over three-tenths of sales of fruits and vegetables, thus making a considerable quantitive as well as qualitative contribution to consumer welfare. Among nonfood goods, imports contribute most importantly to sales of clothing and footwear and also furniture—again a large quality gain for consumers. If these caluclations are near the mark, imports soaked up over 37 billion rubles in purchasing power in 1980, about 13 percent of total disposable money incomes. Substantial increases in retail prices of domestically produced goods would have been required to achieve similar results. So, high priced imports have substituted for unpalatable overt price increases, and a large and growing tax on consumption of imported goods has mostly offset the large and growing subsidies on food that result from the government's policy of maintaining fixed retail prices while countenancing rapid inflation in the prices paid to farmers.

Judging from incomplete data, imports from Communist countries have accounted for a large but decreased share of imports of final consumer goods—54 percent in1970 and 49 percent in 1980, in the case of food; their share in non-food imports has remained at about 80 percent. The LDCs have accounted for more than one-third of all food imports throughout the period, while the share of the developed Western countries has risen from 10 to 14 percent. The latter's share in imports of non-food goods has dropped slightly, while that of the LDCs has risen a little. The proportion of purchases involving hard curreny outlays has increased—from roughly 14 percent to 19 percent of the total. Food, beverage and tobacco purchases made up 42 percent of hard currency outlay for consumer goods in 1970, 60 percent in 1975 and 71 percent in 1980, when final consumer goods comprised nearly one-tenth of all hard currency imports.

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[26] Klochek and Pichugin, op. cit., p. 14.

[27] Sh. B. Sverdlik, Obshchestvennii produkt i deneshnii oborot, Novosibirsk, 1981, p. 63.

[28] Planovoe khoziaistvo, No. 7, 1977, p. 10.

[29] For example, RE/RL, Food Supply in the USSR: Evidence of Widespread Shortages, Soviet Area Audience and Opinion Research, AR 2-82, April 1982.

2. Imports of raw materials and machinery

Imports of consumer-related raw materials increased more than 5-fold during the 1970s—from a mere 1.2 billion rubles in 1970 to 7.0 billion rubles in 1980. As a consequence of the debacle on the farms, the composition of these imports has changed radically. In 1970, grain made up one-tenth of the total, and the rest was fairly evenly divided between raw materials for the food processing industries and for light industries. In 1980, grain comprised 46 percent of the total; raw material for the food and beverage industries, most of it sugar, made up 36 percent, and the rest provided inputs for light industry, mainly textile raw materials and semi-fabricates. Grain imports amounted to some 225 million metric tons in the 1970s, the vast bulk paid for in hard currency. Grain imports were of critical importance in preventing a substantial decline in per capita meat consumption during the latter part of the 1970s. These imports also contributed significantly to maintaining supplies of bread, flour, and baked goods, and, in addition, the U.S.S.R. imported more than 10 million tons of flour and rice. Large imports of raw sugar (23 million tons during 1976–81) helped greatly to shore up the sugar refining industry, although output declined, nevertheless.

Again judging from incomplete data, Communist countries supplied about two-fifths of all imported raw materials; their share was 42 percent in 1870 and 36 percent in 1980. The developed West accounted for 26 percent of the total in 1970 and 43 percent in 1980; the respective shares of the LDCs were 32 and 22. Hard currency outlays represented a rapidly rising share of raw materials imports—30 percent in 1970 and 52 percent in 1980. Roughly 85 percent of grain imports was paid for in hard currencies. Next to grain, the most costly raw material is sugar, most of it imported from Cuba; in 1980, grain and raw sugar constituted more than three-quarters of the total reported value of imports of consumer-related raw materials.

Imports of consumer-related machinery, about half for the food and light industries, nearly quadrupled in current values during the decade and perhaps doubled in real terms. Over four-fifths of this machinery is imported from other Communist countries, mainly the GDR and Czechoslovakia. Although the U.S.S.R. briefly turned to the West for a variety of machinery and new plants for the food and beverage industries during the mid-1970s, imports of consumer-related machinery declined after 1976; in 1980 they made up only 13 percent of total imports, roughly their share in 1970. Since imports of machinery from the LDCs is negligible, hard currency imports are approximately equivalent to those from the West. While imports of machinery in real terms probably increased at about the same rate as domestic production of similar machinery, they contributed importantly to the growth of the capital stock in the light and food industries, particularly the textile industry. Imports accounted for about one-quarter of total investment in 1976–80 in light industry and about one-third of that in the textile sub-branch. Imported machinery and equipment comprised about one-eighth of total investment in the food processing industries during the 1970s. While there are complaints about the quality and modernity of some imported equipment, its average quality doubtless is higher than that of domestically produced equipment, which is the subject of legions of complaints.

III. INCOMES AND CONSUMPTION IN THE 1980'S

A. THE SITUATION IN 1981-82

Instead of having reached Communism by 1980, as Nikita Khrushchev once boasted would be the case, the Soviet people surely must find that goal more elusive than ever, for the new decade has begun most unauspiciously. In 1980, 1981, and 1982, harvests were poor. Growth of per capita consumption dropped to less than 2 percent in 1981 and to less than 1 percent in 1982. There is much evidence of widespread shortages of most quality foods, a situation that the government has sought to deal with through informal rationing, some localized formal rationing, and increased allocation of scarce supplies through places of work. The situation in small and middle-size cities is worse than in the large cities. Hoarding, corruption, and black markets are prevalent, as people scramble to obtain whatever consumer good is in short supply at the moment. The Soviet press reports extensively on the massive disequilibria in the consumer sector, and politicians and economists alike view the situation with alarm, noting its potential threat to the efficacy of incentives and to worker productivity.

B. GOALS OF THE ELEVENTH 5-YEAR PLAN

In line with a planned slower growth of national income in 1981-85 as compared with 1976-80, the plan for 1981-85 also sets somewhat lower targets for all major consumer-related variables. In general, the goals finally approved at the end of 1981 were slightly below or equal to those specified in the original directives announced a year earlier. Table 5 sets forth the major targets and compares them with achievements during 1976-80. On its face, the plan is quite consumer-oriented. By Soviet measures consumption is slated to grow more than twice as fast as investment and other uses of national income; by 1985 the consumption fund (about 95 percent relating to personal consumption and government expenditures on health, education and related services) in national income is to be 78 percent, compared with 75.3 percent in 1980. While Group A (mainly producer goods) industrial output is scheduled to approximately maintain the growth rate achieved during the preceding 5 years, Group B output (mainly consumer goods) is to speed up and to exceed the rate for Group A. Growth rates for soft goods and durables obtaining in 1976-80 are to be essentially maintained, but those in agriculture and the food processing industries are to rise dramatically. While growth of various services is to be curbed somewhat, plans call for building the same amount of housing as in the preceding 5 years. More detailed information indicates that large increases are being planned in the output of quality foods, clothing and household sundries and durables. Per capita meat consumption is supposed to reach 62 kg in 1985 and 70 kg by 1990,[30] a level that was reached in the early 1970s in Poland, the GDR, and Czechoslovakia and by Hungary in 1978. Even more rapid gains are planned in per capita consumption of fruits and vegetables and vegetable oil. Processed foods, high quality clothing, and durables of modern design are scheduled for particularly large advances, along with improvements in the quality of everything.

TABLE 5.—OFFICIAL TARGETS FOR PERCENTAGE GROWTH IN CONSUMER-RELATED CATEGORIES IN THE 1981–85 PLAN

	Original goals	Revised goals	Reported achievements in 1976–80
Total consumption fund	22	22.0	27.0
Social consumption fund	20	23.0	29.3
Real incomes per capita	16–18	16.5	17.7
Average state wages	13–16	14.5	15.8
Collective farmer wages	20–22	20.0	26.1
Retail trade	22–25	23.0	24.0
Group B industrial output	27–29	26.2	21.0
Light industries	18–20	19.0	18.0
Food processing industries	23–26	22.0	7.0
Durables and related goods	40	40.0	41.0
Personal and repair services	40	40.0	43.3
Housing construction (million m² of useful space)	530–540	530.0	530.0
Gross value of agricultural output (increase in total output over total in preceding 5-yr period)	12–14	13.0	7.0

Source: Original goals—Pravda, Dec. 2, 1980. Revised goals—Pravda, Nov. 17, 1981. Achievements in 1976–80—Narkhoz, 1980.

C. OUTLOOK

In line with the planned slower growth of supplies of goods and services, the government also envisages even greater curtailment in the rise of wages, which make up over three-fourths of total household money incomes. The total wage bill for the state labor force is to rise by 17.5 percent, compared with 27.6 percent in the previous 5 years. Although average earnings of collective farmers are to rise faster than those of state employees, their growth is to slow markedly. Nonetheless, preferential treatment of collective farmers will bring their real per capita incomes in 1985 close to the level of state employees; the level was 89 percent in 1979.[31] At the same time, retail trade turnover is slated to increase at almost the same rate as during 1976–80. Reported achievements in 1981 were approximately in line with these plans. Clearly, the government is determined to keep a tight rein on money incomes and push up retail sales by almost any device, short of overt price increases on basic foods and clothing, so as to keep the growth of purchasing power in line with availabilities of goods and services. Adjustments in the wage system are also planned, with a view to enhancing its incentive effects, and various improvements in social insurance benefits are scheduled.

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[30] Targets for 1985 are given in Voprosy ekonomiki, No. 1, 1982, p. 128. Those for 1990 were cited by Brezhnev in his speech at the Central Committee Plenum on the food program. Pravda, May 24, 1982.

[31] Ekonomicheskie nauki, No. 5, 1981, p. 21.

Prospects for continued advances in levels of living in the USSR in the 1980s depend on one's assessment of the prospects for overall economic growth. Conventional projections based on extrapolation of past input/output relationships suggest that GNP probably will increase at no more than 2 to 3 percent annually during the decade. Barring a dramatic upsurge in productivity, slow growth is inevitable, because demographically determined labor increments will fall to half the rate of the 1970s, and the capital stock is bound to grow more slowly as a result of the past slowdown in the growth of investment. With total population rising at 0.8 percent annually, per capita GNP, under this projection, would rise at 1.2 to 2.2 percent annually. Per capita consumption could be expected to rise at roughly similar rates. At the end of the decade, the average person would be one-eighth to one-fourth better off than he was in 1980. Probably the government would focus on maintaining increments in the supplies of food, clothing, durables and housing; gains in the provision of services, which are quite labor-intensive, will be limited, because of the reduced availability of labor. Thus, the 1980s would be a period of austerity, but not serious privation for consumers, whose expectations doubtless already have been adjusted downward as a result of the events of the past 7 years. People would simply have to endure, having no real alternative, with the hope of better things to come.

But a much starker projection is also worthy of serious consideration. The fall in the growth rates of the two most critical sectors—industry and agriculture—in the 1970s was both sudden and dramatic, and the precipitous decline in industry, at least has continued into 1982. Growth in the rest of the economy was dragged down by the worsening performance in these key sectors. While the causes remain to be probed in depth, the roots seem to lie in spreading shortages and deteriorating quality of a handful of critical raw materials and bottlenecks in transportation, along with a swift worsening in the ability of the system to translate new investments into either additional capacities or more effective processes. The cumulative effects of the numerous misguided investment choices of the past could progressively fetter output, causing the economy to unravel and spiral downward, as one bottleneck created another and as fire brigade attacks on one exacerbated another. In the relatively modern Soviet economy, shortfalls in industry would swiftly hobble other sectors, and the key to a turnaround might be hard to find. In such an environment, living standards would stagnate at best (depending on how the farm sector fared) or decline. Again, the people would have to endure, but the political climate might then be ripe for abandonment of the wasteful production-distribution system that brought the economy to such a pass.

Thus far, we have been assessing the prospects for quantitative gains in levels of living as measured by real per capita consumption. Under either scenario, the quality of Soviet life is likely to remain poor and could deteriorate. Substantial improvement in the quality and mix of consumer goods and services and in the efficiency of their distribution requires a genuine reform of the economic working arrangements that have hampered progress in the past. Unless the government permits consumer prices to reflect supply and demand, random shortages and surpluses, queues, waiting lists, black markets, and corruption will remain pervasive. The government will find it difficult to provide a quality dimension by substantially boosting the growth of imports of consumer goods, because of hard currency constraints and the inability of East European countries, facing similar economic problems, to augment supplies of desirable products. The Soviet people likely will continue to relieve their boredom and frustrations through alcohol, and the government will be unable to do much about it.

This somber assessment clearly is not shared by the Soviet leadership. The 11th Five Year Plan projects per capita real incomes (Soviet concept) to grow only a bit more slowly than during the 1970s; in all likelihood, the nascent 12th Five Year Plan (for 1986–90) will set a similar goal. Recognizing the inevitable slowdown in the growth of labor and capital inputs, the government has launched more "reforms of the economic mechanism" intended to boost efficiency, upgrade product quality and tailor supply to market demand.[32] To remedy the ills of agriculture, a special Central Committee plenum held in May 1982 endorsed another round of tinkering with planning and incentive arrangements and the establishment of agricultural production associations at the raion level to combine growing, marketing and processing functions for food products. The government also is once again pushing for expansion of the private agricultural sector, but the measures are puny.[33] When the leadership turns to its economists for advice on further steps to take, it, like governments elsewhere, is met with a cacophony of voices. Some believe that the present state of affairs in the consumer sector seriously threatens the efficacy of work incentives; others are not alarmed. Some economists call for a higher investment rate in order to provide the capital plant to boost consumer goods production; others would opt for a reduced investment rate to relieve the strain on resources. Voices are now being heard in favor of adopting some features of the Hungarian economic reforms, particularly their approach to agriculture and their promotion of small-scale private activity in the services. Nobody is openly proposing abolition of central planning, removal of price controls, introduction of competition, or abandonment of socialism.

The Soviet Union has undergone a change in its political leadership. Yuriy Andropov and his colleagues will have to grapple with the present mess in the economy and the manifest dissatisfaction of their constituents. If the past is any guide, they well may be prone to do something to placate the populace. Their options are few, however, each one fraught with conflicts. Diversion of scarce investment resources to consumption purposes, even though it would conserve energy and please the people, would incur the wrath of the heavy industry firsters and possibly also of the generals. Raising money incomes and social insurance benefits would be an empty gesture without a concomitant flow of goods and services. Large-scale imports of consumer goods, which could only be obtained quickly from the West, would drain scarce foreign exchange from much needed plant and equipment purchases; substantial imports of grain will be required in any case, unless the performance of the agricultural sector improves dramatically. Removal of price controls, with partially compensatory wage increases—as some East European countries have done—would give the lie to the oft-repeated contention that price stability is the hallmark of Soviet socialism: moreover, raising food prices, which is most urgently needed, might spark serious popular unrest, as it did in the early 1960s. Espousal of a really substantial expansion of the private sector would run afoul of ideology, which always has strongly opposed private productive activities outside of agriculture and which seems to be much more deeply rooted in the Soviet Union than in Eastern Europe, where such activity has long been tolerated on a much larger scale.

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[32] See the paper in this volume by Gertrude S. Schroeder, "Soviet Economic 'Reform' Decrees: More Steps on the Treadmill."

[33] See the paper in this volume by Ann M. Lane, "Private Agriculture on Center Stage."

If not faced with a production crisis, the new leadership might adopt any or all of these tactics. No doubt, consumers would benefit for a time. In the long run, however, modernization of the consumer sector—and the economy itself—requires a complete overhaul of the production-distribution system to substitute consumer guidance of production for planners' guidance, with enterprise incentives geared to satisfying clamorous customers rather than instructions of bureaucracies. Should unleashing the entire economy seem too formidable an undertaking, a new leadership might be of a mind at least to launch radical institutional change in agriculture, which under the regimen of socialist central planning has proven to be an omnivorous user of resources and probably the greatest drag on sustained advance in living standards. Slow economic growth per se is highly unlikely to provide the catalyst for radical change; collapse of the industrial sector might do so, as it did some 60 years ago.

VIII. FOREIGN ECONOMIC RELATIONS

OVERVIEW

By George D. Holliday*

I. INTRODUCTION

Since the early 1960's, Soviet trade with the West has increased rapidly. Changes in Soviet trade policy are largely responsible for the increase: Soviet planners decided to give imports from the West a greater role in their efforts to improve living standards and modernize domestic industries. They imported Western grain to improve the quality of the Soviet diet and Western technology to help modernize key industrial sectors.

A combination of international political and economic changes made it easier for Soviet officials to rely more heavily on trade and the West. East-West political tensions waned in the 1960's and early 1970's, and Western trade policies became less restrictive toward the Soviet Union. Western governments relaxed export controls and began actively to promote trade with the Soviet Union. Western corporations rushed to establish themselves in what was perceived to be a growing market. Western lenders rapidly increased their financial exposure in the Soviet Union. Soviet exports to the West also grew, largely as a result of rapidly escalating prices for Soviet oil and other commodities.

Soviet long-term plans to improve living standards and modernize domestic industries have not changed fundamentally in the early 1980's. The international political and economic conditions that contributed to increasing Soviet reliance on trade with the West, however, have changed. New political and economic conditions appear likely to constrain the future growth of Soviet trade with the West. Those changes are the subject of six of the papers in this section.

The other two papers in this section are about Soviet trade with countries in Eastern Europe and with developing countries.

II. SOVIET TRADE WITH THE WEST

Perhaps the most important constraint on Soviet trade with the West is an economic one. Soviet exporters do not earn enough hard currency to pay for needed imports. As Joan Zoeter points out in her study "U.S.S.R.: Hard Currency Trade and Payments," large hard currency trade deficits have already contributed to a cutback of Soviet imports from the West. After large trade deficits (and increasing indebtedness to Western creditors) in the mid-1970's, Soviet trade officials began to curb imports of Western machinery and equipment in 1977. With the help of good grain harvests in 1977–78 and rapidly increasing prices for their exports, Soviet officials managed to reduce significantly their trade deficit. Zoeter estimates that during 1977–80 the annual hard currency trade deficit averaged only $2.9 billion, compared with $6.0 billion in 1975–76. Moreover, the Soviet current account deficit was completely erased. In 1979 and 1980, the Soviet Union achieved sizable surpluses in its hard currency current account.

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The Soviet respite from hard currency deficits, however, proved to be short-lived. In 1981 large purchases of Western grain and declining prices for Soviet oil exports contributed to another current account deficit and a sharp increase in Soviet borrowing abroad. The Soviet net hard currency debt reached $12.5 billion by the end of 1981. Zoeter suggests that Soviet concern about the debt and the poor outlook for increased earnings from exports will lead Soviet officials to curb further hard currency exports.

The adverse economic environment for Soviet trade with the West has been exacerbated by a deterioration of U.S.-Soviet diplomatic relations, accompanied by U.S. efforts to restrict certain aspects of Western economic interaction with the Soviet Union. Indeed, political tensions began to dampen U.S.-Soviet trade shortly after the Nixon administration took the first steps during the period of détente to normalize and expand commercial relations. A trade agreement that would have extended most-favored-nation status to the Soviet Union and a Presidential determination that permitted U.S. Government export credits to the Soviet Union were stymied by passage of the Jackson-Vanik amendment to the Trade Act of 1974. In the late 1970's, in reaction to Soviet foreign and domestic policies, the U.S. Government imposed new controls on exports of certain high technology products to the Soviet Union. The Carter administration added major economic sanctions, including a partial embargo on grain shipments, in response to the Soviet invasion of Afghanistan in 1979.

The paper "U.S. Government Policy on Economic Relations with the Soviet Union," prepared by the Office of the Assistant Secretary for International Affairs, U.S. Department of the Treasury, describes the Reagan administration's initiatives in U.S.-Soviet trade policy. The administration's policy, as described in the Treasury Department paper, is to "move ahead constructively with our economic relations if their [Soviet] behavior warrants it, but * * * if the use or threat of military force or violence remains a key instrument in their foreign policy, U.S. policy will be to make that course unacceptably costly." Where consistent with U.S. political and strategic interests, the Treasury Department paper adds, the United States will maintain the framework for U.S.-Soviet economic relations. In practice, the Reagan administration's policy has meant encouragement of agricultural trade and new restrictions on exports of high technology products. Among the major actions that administration has taken to implement its policy are: Removal of the post-Afghanistan embargo on grain exports; negotiations with U.S. allies to tighten and harmonize controls on transfer of technology to the Soviet Union; imposition of tighter controls on exports of energy-related technologies; and, efforts to restrain Western official export credits to the Soviet Union.

Two apparent effects of the Reagan administration's policy have been to restrain the overall growth of U.S.-Soviet trade and to increase the share of U.S. agricultural exports in total bilateral trade. In this regard the Reagan administration appears to have reinforced the pattern of trade established in the 1970's.

Jack Brougher, in his paper "1979–82: The United States Uses Trade to Penalize Soviet Aggression and Seeks to Reorder Western Policy," calculates that, as a result of Government restrictions on commercial relations with the Soviet Union, U.S. exporters have foregone several billion dollars in exports to the Soviet Union. According to Brougher, among the exports foregone are—

> At least $1 billion in lost exports as a result of withdrawal of access to official credits and non-implementation of the U.S.-Soviets trade agreement;
>
> Approximately $1 billion in lost sales of energy-related equipment as a result of foreign policy controls imposed in 1978;
>
> More than $3 billion in lost exports, primarily in agricultural products, as a result of sanctions imposed in reaction to the Soviet invasion of Afghanistan; and
>
> Possibly $2.5 billion in lost exports by U.S. companies and their foreign subsidiaries and licensees as a result of sanctions imposed in reaction to the declaration of martial law in Poland. (Brougher's estimate of losses resulting from the post-Poland sanctions would presumably be greatly reduced after President Reagan's removal of the foreign policy controls in November 1982.)

Brougher presents trade data from the Department of Commerce which show that agricultural products, primarily corn and wheat, have dominated U.S. exports to the Soviet Union during the 1970's and 1980's. Agricultural goods have generally accounted for 60–80 percent of total U.S. shipments to the U.S.S.R. Brougher suggests that, because of U.S. Government national security and foreign policy controls on other types of exports, the dominance of agricultural exports in U.S. trade with the Soviet Union is likely to persist.

Data presented in Brougher's paper and in William H. Cooper's "Soviet Western Trade" suggest that another effect of U.S. trade policy may have been to divert Soviet trade to other industrial Western countries. While U.S. exports to the Soviet Union fell by about 17 percent between 1975 and 1980 (from $1.8 billion to $1.5 billion), exports by other industrial Western countries to the Soviet Union increased by over 80 percent (from $10 billion to $18.3 billion). The different trends in trade with the Soviet Union reflect different policies and attitudes among Western governments. In surveying the policies of five Western countries—the Federal Republic of Germany, France, Italy, the United Kingdom, and Japan—Cooper finds that in recent years, they have been less inclined than the United States to mix political and economic relations with the Soviet Union.

Cooper cites the reactions of the five Western governments to the invasion of Afghanistan and the declaration of martial law in Poland as evidence of their willingness to preserve their economic relations with the Soviet Union. While each of the five governments took some actions to show its disapproval of Soviet behavior, none followed the U.S. lead by allowing a major disruption of commercial relations with the Soviet Union. In 1980, for example, they agreed not to undercut the U.S. sanctions, but proceeded with commercial transactions that were already underway. In 1982 they insisted on proceeding with large joint projects in the energy sector (the Siberian-West European gas pipeline and a Japanese-Soviet energy development in Sakhalin) despite U.S. sanctions. The conduct of East-West trade relations has developed into a divisive issue in the Western alliance.

Cooper observes that, although the Soviet Union is not a major trade partner for any of the five Western countries, it has been an important customer or supplier for certain sectors of their economies. It provides, for example, a significant percentage of the energy imports of France, Germany, and Italy and exports other important raw materials to each of the five countries. (The United Kingdom is least dependent on Soviet exports because of the development of its North Sea resources.) Soviet importers are significant customers for certain manufactured goods produced in the five countries, especially steel products, machinery and equipment.

According to Cooper, each of the five governments appears to value its trade with the Soviet Union and has taken steps to promote future trade relations. He concludes, however, that the future growth of their trade with the Soviet Union could be constrained by Soviet hard currency limitations, domestic economic conditions and international tensions.

Two of the papers in this section, "Choosing a U.S. Trade Strategy Towards the Soviet Union," by Thomas A. Wolf, and "An Economic Model of United States and Western Controls on Exports to the Soviet Union and Eastern Europe," by Thomas O. Bayard, Joseph Pelzman and Jorge F. Perez-Lopez, provide conceptual frameworks for analyzing the costs and benefits of alternative trade policies toward the Soviet Union.

Wolf's paper analyzes the costs and benefits of basic, long-term policies on trade with the Soviet Union. Wolf assumes that Western foreign policymakers have some desired level of influence over Soviet domestic and foreign policies and examines three strategies for attaining such influence. The first is a strategy of leverage, whereby under threat of limiting trade relations, Western policymakers continually seek to obtain non-economic concessions from Soviet leaders. The second is non-economic containment, a strategy in which Western policymakers seek to attain some level of influence over Soviet behavior through diplomatic or military means. The third is a strategy of economic containment, in which Western policymakers attempt by means of an economic embargo to reduce Soviet gains from trade and hence its ability to pursue its goals.

Each of Wolf's strategies entail a certain level of costs and may, under the right conditions, yield benefits in the form of increased influence over Soviet behavior. A strategy of leverage, for example, is the lowest cost approach because, if successful, it results in gains from trade as well as the achievement of non-economic goals. After reviewing U.S.-Soviet trade relations in the 1970s, however, Wolf concludes that a pure strategy of leverage is unlikely to be successful: by agreeing to trade with the Soviet Union, U.S. policymakers are unlikely to attain their desired level of influence.

Wolf concludes that one of two mixed strategies is more likely to succeed. On the one hand, U.S. policymakers can pursue a strategy which combines leverage and non-economic containment. This approach entails using trade with the Soviet Union in combination with diplomatic or military means to obtain influence over Soviet behavior. On the other hand, U.S. policymakers can pursue a strategy which combines an economic embargo with non-economic containment. This approach uses an economic embargo to raise the costs of offensive Soviet behavior in combination with diplomatic or military means to influence the Soviet Union. According to Wolf the choice between the two mixed strategies should depend on assessments of the degree of leverage that is attainable and of the relative costs to the U.S. economy of embargo versus non-economic containment.

The paper by Bayard, Pelzman and Perez-Lopez presents a model of the economic implications of Western controls on exports to the Soviet Union and Eastern Europe. The authors examine the conditions under which it may be feasible for the United States alone or in concert with other Western nations to inflict economic costs on the Soviet Union and Eastern Europe. They base their model on cartel theory, noting that the economic effectiveness of export controls depends the Western exporters' oligopoly power—their ability to restrict sales and raise prices.

Bayard, Pelzman and Perez-Lopez present a methodology for measuring the potential costs and benefits of imposing hypothetical controls on exports to the Soviet Union and Eastern Europe. They define the costs to the Western countries as: (1) the short-run adjustment costs due to the potential loss of Western output and employment opportunities; (2) plus the costs of administering the controls; and (3) less any terms of trade gains associated with higher export prices resulting from supply restrictions. The economic benefits for the West are the costs imposed on the Soviet Union and Eastern Europe. The authors emphasize that their model can only be useful in measuring economic costs and benefits of export controls. They do not address the equally important consideration of whether the imposition of economic costs can help to achieve a given political objective.

Soviet Commercial Relations With Eastern Europe

Soviet foreign trade and domestic economic problems are compounded by its economic relationship with Eastern Europe. Elizabeth Ann Goldstein's paper "Soviet Economic Assistance to Poland, 1980–81" gives estimates of the burden borne by the Soviet economy to help regenerate the Polish economy and maintain the current Soviet-Polish political relationship. Goldstein examines the various types of foreign assistance, defined as the sum of grants, credits, loans and trade subsidies, extended to Poland from East and West. She concludes that most foreign assistance to Poland in

1980–1981 came from the Soviet Union: the approximate Soviet shares were three-fourths in 1980 and 90 percent in 1981. Western countries and other East European countries provided relatively small and declining shares of total foreign assistance to Poland. Goldstein estimates that the total value of Soviet assistance in 1980 was about $4.3 billion and in 1981, about $5.6 billion.

The composition of Soviet assistance to Poland illustrates the extent of the burden borne by the Soviet economy. In 1981, despite its own hard currency problems, the Soviet Union extended an estimated $400 million in hard currency loans to Poland. Soviet trade subsidies, estimated by Goldstein to total over $3.8 billion in 1981, helped Poland to import Soviet fuel and energy and other valuable resources. As Joan Zoeter notes, diversion of such exports to Western markets could help the Soviet Union finance valuable imports of grain and technology.

Why do Soviet leaders provide such assistance to Poland (and to a lesser extent to other East European countries), at great cost to the Soviet economy? Goldstein and Zoeter suggest that it is the price which Soviet leaders have to pay to avoid political unrest and reduced Soviet control in Eastern Europe. It is likely to continue to burden the Soviet Union for the foreseeable future.

Soviet Trade With Developing Countries

One of the bright spots for Soviet foreign trade in the 1970's and early 1980's has been the rapid growth of arms sales to developing countries. Zoeter observes that the Soviet Union's role as a major supplier of military equipment to developing countries has had a positive effect on its hard currency balance of payments. Hard currency receipts from such sales, according to Zoeter, increased from less than $100 million in the 1970's to $3.7 billion in 1981. Arms sales comprised about one-half of all Soviet exports to developing countries.

Since Soviet foreign trade statistics do not provide data on arms sales, our knowledge of their value and volume are based on estimates by Western observers. An analysis of Soviet foreign trade statistics for 1973–1974 by Thomas A. Wolf and Edward A. Hewett in their paper "A Puzzle in Soviet Foreign Trade Statistics and Possible Implications for Estimates of Soviet Arms Exports to Developing Countries" suggests that Western analysts may have significantly understated Soviet arms shipments in real terms.

Wolf and Hewett analyze the percentage changes in Soviet real exports and export unit values to capitalist countries (that is, Western developed and developing countries). The official data imply that Soviet real exports to the West of products other than certain key raw materials increased rapidly, while the prices for those exports declined. Given the underlying inflationary conditions in world markets at the time, according to the authors, such a decline in prices is unlikely. They suggest, however, that such a price decline for Soviet exports of arms to developing countries is plausible. It is possible, they say, that the Soviet Union pushed arms on various countries at such a rapid rate that they were forced to cut prices.

The analysis by Wolf and Hewett highlights the problems of using official Soviet data to study Soviet foreign trade. According to the authors, their study creates new doubts concerning the internal consistency and reliability of Soviet statistics and raises questions about Western estimates of Soviet arms shipments to developing countries.

U.S. GOVERNMENT POLICY ON ECONOMIC RELATIONS WITH THE SOVIET UNION*

INTRODUCTION

During the 1970's the U.S. Government's policy on U.S.-Soviet economic relations was determined in accordance with the philosphy of detente, which governed our overall relations with the Soviet Union. A major precept of detente was that trade and other aspects of East-West economic relations could induce the Soviet Union to act within the bounds of what we would consider generally acceptable behavior. The Soviets, it was argued, needed goods and technology that their economy was not capable of producing efficiently and were anxious to buy them from the Western countries. By encouraging such trade, we would create, if not a dependency on, at least a stake in its continuation. The Soviets would, it was asserted, moderate their behavior in other areas in order to avoid jeopardizing their access to Western products.

It was also believed that the commercial relationships created would serve as channels of communication through which Western ideas and values would flow into the Soviet Union. Over time, these flows would generate or encourage political and economic changes within the Soviet Union that would benefit us.

Implementation of this approach got off to a strong start. A joint commercial commission, a trade agreement, and a number of other agreements and bilateral groups were established to advance and institutionalize the development of our trade relations with the Soviets.

The momentum toward establishment of closer ties was interrupted, however, by passage of the Jackson-Vanik Amendment to the Trade Act of 1974, which linked most-favored-nation tariff treatment and Export-Import Bank financing for the Soviet Union to its emigration policy. The Soviets refused to meet the conditions imposed in the Act, and the interruption evolved into an indefinite stall that lasted until the late 1970's. As a result, hopes for improved trade relations were ultimately stifled.

Subsequently, due to increasingly hostile and belligerent Soviet actions, the near-term prospects for an expanded U.S.-Soviet economic relationship have diminished. The unprecedented Soviet military build-up; their increased use of military force, directly and indirectly, as a foreign policy instrument; and a disturbingly cavalier attitude toward international agreements such as the Helsinki Final Act produced a retrogression in our relations. In 1978, in large part in reaction to Soviet and Cuban intervention in African affairs and the Soviets' treatment of domestic dissidents, the U.S.

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*Prepared by the Office of the Assistant Secretary for International Affairs, U.S. Department of the Treasury.

Government placed new licensing requirements on exports of oil and gas equipment.

A major turning point was the Soviet invasion of Afghanistan in December 1979. In retaliation, the United States imposed a number of sanctions on the Soviet Union—some of which are still in effect. Among them were embargoes on exports of grain and enriched phosphates, a tightening of controls on exports of high technology and oil and gas equipment to the Soviet Union, and a boycott of the 1980 Summer Olympic games in Moscow.

CURRENT U.S. POLICY

The Reagan Administration took office with the lessons of this recent history in mind. One lesson was that East-West competition is based on fundamental and enduring conflicts of interests and outlooks and that Soviet behavior is more influenced by hard facts than good intentions. Economic relations are a key element in this competition, since strategic trade, technology transfers, and their financing have long-term national security implications. A second was that East-West economic relations, especially with regard to high technology trade and official financing on concessionary terms, must coincide with our overall political and security objectives.

On the basis of these lessons, the Reagan Administration has implemented a policy designed to provide the benefits of trade with the Soviets, as long as it is consistent with broad U.S. political and security objectives. The basis for this approach is an emphasis on restraint and reciprocity. The United States has repeatedly made it clear to the Soviets that (1) it is prepared to move ahead constructively with our economic relations if their behavior warrants, but (2) if the use or threat of military force and violence remains a key instrument in their foreign policy, U.S. policy will be to make that course unacceptably costly.

This policy does not constitute a declaration of economic warfare against the Soviet Union; nor have we encouraged our allies in this direction. Where it is consistent with our political and strategic interests, the United States will maintain the framework for U.S.-Soviet economic relations.

U.S. policy is also based on recognition of the fact that its effectiveness will be enhanced to the extent that our allies support our objectives and cooperate in their implementation. We strongly believe that it is in the interest of the Western countries to act jointly to reach a consensus on a long-term approach to economic relations with the Soviet Union. Therefore, we have attempted to coordinate our policy as much as possible with those of our allies. In the political/military context, our allies share our general assessment of Soviet actions and of the need to restrain and counter Soviet power. In the economic sphere their views are heavily influenced by a strong belief in the détente approach and the economic benefits they have derived from it.

Nevertheless, we have succeeded in obtaining agreement on the need to strengthen controls on the export to the Soviet Union of critical technology and goods in the Coordinating Committee for Multilateral Export Controls (COCOM), a group established in the

1940's through which the member governments coordinate their controls on exports to the Communist countries. A broad consensus was reached at the Ottawa Economic Summit in June 1981 and a decisive political mandate was provided at a following, high-level COCOM meeting in January 1982. We are seeking to tighten and harmonize controls on the transfer of high technology with defense implications.

RESPONSE TO THE POLISH CRISIS

We and our allies, acting both unilaterally and in cooperation, have also imposed sanctions on the Soviet Union for its complicity in the declaration of martial law in Poland in December 1981. These sanctions are designed to raise the cost to the Soviets and the military regime in Warsaw of the brutal repression of the Polish people. We agreed with our allies that the Poland-related sanctions should remain in effect until the Polish Government releases its political prisoners, lifts martial law, and resumes a dialogue with the Church and Solidarity.

The U.S. Government also sought to obtain agreement among the major Western countries to restrain officially supported credits—both direct loans and guarantees of private financing—to the Soviet Union. One rationale for such an agreement was that it would forestall the Soviets from building up a substantial debt to the West—which our analyses showed was a possibility in view of their unfavorable economic and financial prospects—and thus deny them the leverage such an accumulation of debt would entail. Another was that a restricted flow of credit would make the Soviets' resource allocation decisions more difficult at the margin.

The U.S. initiative culminated in agreement among the participants in the Versailles Economic Summit meeting in June 1982 to handle cautiously financial relationships with the U.S.S.R. (and other Eastern European countries), in the language of the communique, "in such a way as to insure that they are conducted on a sound economic basis, including also the need for commercial prudence in limiting export credits." The development of economic and financial relations will be subject to periodic ex-post review by the Summit countries. There was also agreement among the Summit participants that the data collection of the Organization for Economic Cooperation and Development (OECD) on all aspects of our economic, commercial and financial relations with the Soviet Union and Eastern Europe should be strengthened.

In addition, the U.S. Government has expanded its controls on exports of oil and gas equipment and technology to the Soviet Union. The controls were applied in two phases. In December 1981 the President announced expansion of export controls on the sale of such items of U.S. origin and the suspension of licensing of controlled exports to the Soviet Union. At that time, he made it clear that further concrete actions would follow if the repression in Poland continued. In June 1982, in view of the lack of progress toward reconciliation in Poland, the President decided to expand the December sanctions to cover foreign subsidiaries and licensees of U.S. firms. This action was intended to prevent the replacement by these entities of the U.S. equipment and technology blocked by the December measure.

While the sanctions focus broadly on the critical area of energy development in the U.S.S.R., their major impact has been on the construction of the Siberian pipeline, through which the Soviets plan to export gas to Western Europe. The sanctions are intended to both delay and increase the cost of the pipeline.

The reaction of our European allies has been sharply negative. They are strongly committed to purchasing gas from the pipeline and are distressed that our actions could prevent them from fulfilling contracts to supply equipment and services for its construction. One of their major specific objections is that the sanctions are being applied extraterritorially and retroactively. Several governments have taken steps to block our enforcement efforts and European firms have been made subject to export restrictions for their noncompliance with U.S. law.

The United States did not impose a grain embargo, another major option. The post-Afghanistan embargo on grain had been rescinded by the President on the grounds that it unfairly damaged one sector of the U.S. economy (agriculture) and was ineffective insofar as the Soviets were able to satisfy their import needs by buying grain in other countries. These same reasons were behind the decision not to reimpose it.

CONCLUSION

In the absence of any significant improvement in the situation in Poland, it is unlikely that there will be improvement in U.S.-Soviet economic relations in the foreseeable future. The U.S. Government has made it clear to the Soviets that any positive movement in our trade relationship will depend on their behavior.

Even a lessening of tension in the next few years, however, would not result in a resumption of relations on the basis established during detente. Our experience over the past decade has shown clearly that the premises on which the theory of detente were based are not valid. As is the case now, the U.S. posture during any period of relaxation of tensions must be based on a realistic calculation of both our strategic and economic interests.

CHOOSING A U.S. TRADE STRATEGY TOWARDS THE SOVIET UNION

By Thomas A. Wolf [*]

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I. INTRODUCTION

Seldom has it been as difficult as it is now to describe "the" U.S. policy towards East-West trade, let alone to explain it. This is disturbing because the United States appears to be at a major policy crossroads, in view of the possible strategic importance of several specific policy decisions—to promote or curtail further grain exports to the Soviet Union; to attempt to slow down or expedite construction of the West Siberian pipeline; to help or hinder certain East European countries in their debt rescheduling.

Given the confusing state of present U.S. policy and the strategic significance of some of these specific policy choices, a major reassessment of U.S. trade strategy towards the USSR is in order. This paper elaborates a conceptual framework for analyzing the costs and benefits of basic strategic U.S. trade policy options for the 1980s. The focus here is on the longer-run, strategic context within which more specific U.S. East-West trade policies, such as whether and in what volume U.S. grain might be sold to the Soviets, should be formulated. Regarding Eastern Europe, our premise is that U.S. economic relations with this area are likely to be conditioned, for better or worse, by the fundamental choices made by the U.S. and the Soviet Union in the context of their bilateral adversarial relationship.

In an earlier paper we suggested that four basic "concerns" have tended to dominate U.S. East-West trade policy formulation since the late 1960s. These are (1) the direct or indirect threat to U.S. "national security" which the export of equipment and technology to the communist countries may pose; (2) the potential for using trade to exert "leverage" on the Soviet Union; (3) the "equity" of the distribution of East-West trade gains; and (4) moral and human rights concerns.[1] In recent years, a more pronounced slowdown in Soviet economic growth, coupled with increased projection of Soviet military and political power in certain areas of the world, has suggested a fifth fundamental "concern" for U.S. East-West policymakers. This involves the impact that East-West trade may have on the basic economic wherewithal with which the Soviet Union can continue to expand its influence, particularly in the Third World. Although in many instances the expansion of Soviet influence and power abroad may not present an immediate threat to U.S. national security, such developments should not be looked upon by American strategists with equanimity. It is within the context of these five policy concerns, then, that the conceptual framework of this paper is elaborated.

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Various combinations of three basic strategies are examined in the paper: Leverage, economic containment (or outright embargo), and non-economic containment (i.e., containment of Soviet influence through diplomatic and military means). As will be explained, leverage and economic containment as strategies are assumed to be mutually exclusive. Either strategy, however, may be combined with non-economic containment. In formulating a rational long-run trade strategy towards the Soviet Union, it is assumed that U.S. policymakers would seek to attain basic foreign policy objectives by selecting that combination of strategies that minimizes the economic costs to the American economy.

Different facets of our conceptual framework are developed in sections II–V. In section IV, while discussing the determinants of leverage, we attempt to explain some of the fundamental differences between U.S. and West European perceptions regarding leverage. In section VI we use our analytical framework to review briefly recent developments in U.S. trade strategy towards the Soviet Union and possible future directions. Our basic conclusions are summarized in section VII.

II. ACHIEVING FOREIGN POLICY OBJECTIVES AT MINIMUM COST

We begin by assuming that Western foreign policymakers have some desired level of influence over Soviet behavior. For example, if the USSR is perceived as "expansionist", the "containment" of Soviet expansionism is the desired outcome. Ignoring at this juncture how one would go about measuring "level of influence", we nonetheless assume that this level is a function of (1) the Western policymakers' models of Soviet intentions and (2) the breadth of the strategic arena within which they perceive that the strategic competition is taking place.

We assume that the desired level of influence over Soviet behavior is greater, the farther we move along the spectrum of Western perceptions of Soviet geopolitical intentions from "defensive" to "opportunistic" to "expansionist", to use a conceptualization employed by Milburn, Stewart and Herrmann (1982). The breadth of strategic arena can we visualized in at least two dimensions. One dimension is the geographical arena. The desired level of influence is posited as greater, ceteris paribus, for a country that sees its competition with the USSR as global rather than merely regional. A second dimension would be Soviet domestic affairs. If Western policymakers see Soviet human rights policies, for example, as a legitimate foreign policy concern, then the desired level of influence will be greater than otherwise. Generally speaking, it seems reasonable to ascribe to recent American administrations a higher desired level of influence over Soviet behavior than to the West Europeans, because Americans often operate with a less benign model of Soviet intentions and within a broader strategic arena.

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[1] Wolf (1979).

We assume that the desired level of influence on Soviet behavior can be achieved in three basic ways. The lowest cost approach is a strategy of leverage, whereby under threat of severing mutually profitable trade relations or refusing to develop potential trade opportunities, Western policymakers continually seek to obtain non-economic concessions from Soviet leaders. Leverage, if achieved, is the least expensive instrument of foreign policy, since its use means that both the trade gains as well as our non-economic objectives are achieved.

A leverage policy only imposes costs on the leveragor if he is unable to attain his desired level of influence through leverage and he fails to supplement the leverage policy with non-economic containment. We shall call this situation one of chronic excess demand for leverage. It imposes costs because either the desired level of influence over the USSR is not achieved, or the leveragor will be forced to make good on some of his threats of trade denial (which means the loss of trade gains to both sides), he will be frustrated by his lack of success, specific trade policies will become erratic and raise the degree of uncertainty for domestic traders, and there will be recrimination and squabbling with other countries as the leveragor blames his lack of success on "unfaithful" allies.

By non-economic containment we mean a strategy by which the Western policymaker seeks to attain some level of influence over Soviet behavior through diplomatic and military instruments. For example, by raising its own military expenditures of a certain type, the West will raise the costs to the Soviets of maintaining a certain perceived threat to Western security by causing them to divert increased resources from civilian into military production. If these costs are great enough, the Soviets may be forced to cut back on those activities constituting the threat. Unlike the leverage strategy, through which each side "gains" through trade, both sides tend to incur economic costs under the noneconomic containment approach.

The third basic strategy by which one can attempt to influence Soviet behavior is economic containment, or what we will call, for simplicity, "embargo". In this case, attainable leverage on a continuing basis is seen as non-existent or in any event as limited, and the Western party attempts, by means of an embargo strategy, to reduce Soviet gains from trade and hence its economic wherewithal to pursue its intended (as perceived) strategy. The economic costs of this strategy to both sides are simply the foregone trade gains attainable under a leverage strategy.

Because successful leverage yields gains from trade, leverage would clearly be the preferred strategy for policymakers desiring a certain level of influence over Soviet behavior. Economic and/or non-economic containment would only become attractive strategy complements (but embargo would only be a substitute for leverage) in the event that Western policymakers have excess demand for leverage. A critical determinant of both the "supply" of leverage and the relative efficiency of these strategies is the gain to each side from bilateral trade. We must examine this factor in detail in the next section before returning to the leverage issue in Section IV.

III. ABSOLUTE, PROPORTIONATE AND RELATIVE GAINS FROM TRADE

Imagine some level of free trade between a Western country (A) and its adversary (B). Define the total gain to both sides from this trade as G, where G comprises both the static and more problematic dynamic gains from trade, and where G is assumed, for simplicity, to be proportionate to the level of trade. Given initial full employment of resources, the static gain would consist of the typical welfare effects associated with the movement toward free trade. If one or both of the countries is able to increase employment by means of this trade, we consider that a static gain. Even if expanded trade were to have no net effect on the level of overall employment in a country with less than full employment, a country would still gain from trade because of being able to expand its consumption possibilities at a given level of domestic resource utilization. (This gain is often ignored by West European observers who have suggested that the net job creation effect of East-West trade is not significant, and who therefore conclude that American arguments that Western Europe has an important economic interest in this trade are exaggerated.)[2] Dynamic gains might include such factors as the impact of imported technology by B on its future production possibilities.

Let the total gain from trade be distributed between A and B in some way reflecting such factors as the distribution of dynamic gains and relative bargaining power. A and B receive shares g_A and g_B respectively, where $g_A+g_B=1.00$. The *absolute* gains from trade are $G_A(=g_AG)$ and $G_B(=g_BG)$ respectively.

We shall define the *proportionate* gain to each country as the proportion that its absolute gain bears to its national income. Thus for A, the proportionate gain from trade with B is G_A/Y_A, or $\hat{Y}_A$, where Y_A is A's national income. The proportionate gain to B is $\hat{Y}_B$.

Often, in an East-West context, the proportion that a country's East-West trade bears to its total trade is cited as a meaningful figure in and of itself. Thus Jacobsen (1981), for example, notes that East-West trade accounts for a larger share of most CMEA countries' trade than of most OECD countries' trade, and that this implies that the East gains relatively more from East-West trade. We would submit that a more useful measure is the proportionate gain as defined above. While bilateral FRG-USSR trade may constitute a smaller share of total trade for the Federal Republic of Germany than for the Soviet Union (2.3 percent versus 4.7 percent), foreign trade (total turnover divided by two) is more important in the FRG relative to national income (say, 21.8 percent versus 12.6 percent). Thus the proportionate gain from bilateral trade, assuming for a moment that the distribution of gains is equal (i.e., $g_A = g_B$), might be roughly the same in the two countries.[3]

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[2] See, for example, Bethkenhagen and Wessels (1981) and Bethkenhagen (1982).

Now if A were to embargo trade with B, what would be the economic costs to both sides? The initiator of the embargo, A, would lose its total initial gain (G_A) less whatever gain it might be able to earn by diverting part or all of its trade with B to other countries. The loss to B will be greater: (1) The more dissimilar are demand and supply conditions between A and other potential trading partners of B (thus leaving less scope for B substituting them for A), and (2) the greater A's success in getting these other countries to join it in an embargo.[4]

We now have a basis for examining the *relative* gain to B from trading with A, where the relative gain (X) is defined as the ratio of B's proportionate gain to A's proportionate gain:

$$X = \hat{Y}_B / \hat{Y}_A \tag{1}$$

To ask whether B receives a greater proportionate gain (in other words, a relative gain greater than 1.00) is to ask whether: [5]

$$\frac{g_B}{g_A}(1 - G'/G) \gtrless \frac{Y_B}{Y_A} \tag{2}$$

where G, g_A, g_B, Y_A and Y_B are as defined before, G′ is the post-embargo gain arising from expanded trade between B and third countries (C) as a result of A's embargo, and where for simplicity we assume that A does not divert any of its former trade with B to C because of fears it will be further diverted to B.

From expression (2) we can see that the relative gain to B from trading with A is greater: (1) the larger the share of bilateral gains going to B (g_B/g_A); (2) the smaller the post-embargo gains from diverted trade (by B) relative to the pre-embargo free trade gains (G'/G); and (3) the smaller B's income relative to A's (Y_B/Y_A). If A's embargo were totally unsuccessful in imposing costs on B because third countries took A's place at a negligible difference in cost, $G' = G$ and the relative gain to B of trade with A is zero. On the other hand, if A would be successful in imposing an airtight collective embargo on B, $G' = O$ and we have:

$$\frac{g_B}{g_A} \gtrless \frac{Y_B}{Y_A} \tag{2a}$$

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[3] These rough trade shares were derived from Bethkenhagen (1982), CIA (1979), Treml and Kostinsky (forthcoming), and Vneshniaia Torgovlia SSSR: Statisticheskii sbornik for 1978 (USSR) and 1979 (West Germany).

[4] These conditions are explored in more detail in Wolf (1973).

[5] Expression (2) is derived in the Appendix.

In this case, B gains relatively more than A from mutual trade if its share of the bilateral trade gain is larger than its share of the combined incomes of the two countries.

This notion of relative trade gain bears some resemblance to Wiles' (1969) "principle of relative gain" except that he seemed to have in mind a comparison of absolute gains (as we have defined them here) rather than proportionate gains.[6]

IV. THE DEMAND FOR AND SUPPLY OF LEVERAGE

We assume that the possibility of actually achieving leverage, or the "supply" of leverage, is positively related to: (1) The relative economic gain to the adversary (the object of leverage) from bilateral trade (i.e., X); (2) the ability of the leveragor to coordinate internally its trade policies; (3) the relative sensitivity of the adversary's leadership to domestic economic pressures; and (4) the mutability of the adversary's policies in the short- and medium-run.

First, the greater the relative gain to the adversary from trade (or, alternatively, the greater the relative opportunity cost to it of the cessation of bilateral trade), the more likely our threat to sever trade relations will lead the adversary to make non-economic concessions, ceteris paribus. (What is critical, however, is each side's perception of this relative gain, and these perceptions may differ.)

Second, internal coordination of trade policies by the leveragor would also seem to be an important determinant of leverage. This has been a chronic problem for a succession of U.S. administrations. One need only recall the inability of the Nixon Administration to "deliver" on its promise of most-favored-nation tariff status and export credits in 1972–74, to realize the difficulties of pursuing a leverage strategy in a political system dedicated to the "separation of powers".

Third, if democratic governments must be more sensitive than authoritarian regimes to domestic economic (and political) dissent, then one might conclude that democracies are ill-suited, in general, to the pursuit of leverage strategies. Finally, a leverage strategy is more likely to be successful the more pragmatic and less dogmatic are the adversary's leaders, and therefore the more likely they will be willing to make concessions in the non-economic dimension.

Consider the bilateral relationship between the United States and the Soviet Union. Assume some level of U.S. demand for leverage which is a positive function, as discussed in section II, of Americans' desired level of influence over Soviet behavior. Assume that U.S. leverage possibilities are a positive function of X, the relative Soviet gain from bilateral trade, as well as being conditioned by the other above-mentioned determinants of the supply of leverage. Imagine, that at the existing relative gain to the USSR, U.S. policymakers actually have excess demand for leverage. In other words, leverage possibilities are below the level of leverage desired.

The question is how will U.S. policymakers perceive this situation, and how will they respond? If policymakers misperceive and believe that leverage possibilities are as great as the quantity of leverage demanded, then they will be frustrated and the U.S. will suffer some of the costs cited earlier as being associated with chronic excess demand for leverage. Indeed in Section VI, we will argue that more often than not, at least in the last 10–15 years, U.S. East-West trade policymaking has been characterized by a chronic, largely unrecognized, excess demand for leverage. This problem was unrecognized largely because U.S. policymakers tended to overstate both the relative gains from trade to the Soviets and the leverage possible at any level of relative gain.

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[6] Wiles (1969, pp. 465–66) suggested that "it is not irrational to do the enemy absolute good, provided we do ourselves more good".

If policymakers correctly perceive that there is excess demand for leverage, they then have to choose between two mixed strategies: (1) Leverage combined with some level of non-economic containment, or (2) some combination of embargo and non-economic containment. This choice, and the factors affecting it, will be considered in the next section.

Expression (2) can be used to analyze what appear to be significant differences, regarding perceptions of East-West leverage, between the West Europeans and the Americans. First, seldom do West Europeans protest that the share of the trade gains going to their CMEA partners is "too large". In the United States, on the other hand, the common perception, ever since U.S. trade with the East became more than negligible in the early 1970s, has been that the CMEA, and in particular the Soviet Union, receives disproportionately high gains from this trade.[7] In effect, Americans generally perceive a higher g_B/g_A ratio than do the West Europeans, and this means they perceive higher relative Soviet gains from trade ceteris paribus.[8]

Second, if export structures in East-West trade are perceived as more similar among individual West European countries than between Western Europe and the United States, then West Europeans might perceive the ratio G'/G to be closer to unity than do American policymakers. This would appear to be a realistic perception because of the vast importance of grain and other agricultural products in American exports to the East, whereas the West Europeans have tended to export, on a highly competitive basis, intermediate and finished manufactures to the region. Again, this would lead Americans to attribute greater relative gains to the Soviets than do the West Europeans (see expression (2)). This assumes, of course, that it is the "national" perception that dominates in Western Europe, and not a "West European" one, but this is not an unreasonable assumption, particularly in a period of excess productive capacity in West European export industries.

Third, a "national" as opposed to "European" basis for evaluating relative gains in East-West trade would lead to a higher perceived Y_B/Y_A ratio than otherwise. To see what effect this has on the perceived relative gain from trade, consider the case in which $G'=O$ (i.e., any embargo would be leakproof). Next, consider that Soviet GNP is equal to roughly one-half that of the U.S., but is twice that of the largest West European country. From the U.S. perspective, the relative gain to the USSR in the U.S.-Soviet trade would be greater than unity if the Soviets were perceived to obtain anything more than one-third of the total trade gains (i.e. $g_B/g_A >$ 0.5). From the vantage point of the West European nation, however, the relative gain to the Soviets in its bilateral trade with the USSR would be greater than unity only if more than two-thirds of the gain were perceived as accruing to the Soviets.

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[7] See, for example Huntington (1978), and Vernon (1974, 1979).

[8] This argument for a disproportionately high Soviet share of the trade gains must rest largely on the traditional "small country" static gains or be attributed to various dynamic gains to the Soviets. Recent work of Wolf (1979, 1982, in press) suggests that the Soviet Union is not likely to be a big gainer in East-West trade from the exercise of market power by its state monopoly of foreign trade.

Fourth, it is possible that West European policymakers tend to make (implicitly) this type of calculation for their East-West trade with the CMEA region as a whole, whereas the U.S. is preoccupied with its relationship with the Soviet Union. This would yield a higher value for Y_B for Europeans in expression (2) and would again bias the West European calculation of the relative gain to the East downward and the U.S. calculation upward.

Together, these different considerations suggest a perceived relative gain to the East, from the vantagepoint of individual West European countries, and even from that of Western Europe as a whole, which is less than that for the United States. Indeed, if for the FRG, for instance, the USSR's relative gain were low enough, it might be the Soviet Union which had the leverage. In reality, the Soviets might see their own leverage possibilities as being negligible, however, because a Soviet threat to embargo trade with the FRG might lead to retaliation by other West European countries, in effect wiping out Soviet gains in their other bilateral relationships.

The Reagan Administration, however, has tended to suggest at times that the Soviets have potential leverage on the Germans. But at other times, the Administration talks of the massive economic gain which will accrue to the Soviets, in terms of maintaining or expanding their real hard currency import capacity, from the proposed West Siberian pipeline in which the Germans are playing a leading role. This tends to suggest that the Soviets stand to gain mightily, even in relative terms, from the pipeline and associated credits, and that Soviet leverage on the West Europeans is therefore limited. Perhaps a more realistic view is that both sides would gain significantly from the pipeline and that it gives neither side leverage over the other. This might be how a large segment of the West German leadership views that country's Osthandel.

A more sophisticated American argument against the pipeline would be that increased mutual economic interdependence between the USSR and Western Europe, associated with the construction and operation of the pipeline, will reduce American influence over the West Europeans and diminish the cohesiveness of the Western alliance more generally, with respect to East-West issues.

If West European perceptions of Soviet intentions are also more benign than those of the Americans, and they have a narrower strategic arena ("detente within Europe"), then the West European demand for leverage will be less than that of the Americans. Thus West European excess demand for leverage might be lower than that of the Americans, even assuming leverage possibilities happened to be identical. This would also mean a smaller West European demand for containment, ceteris paribus (more on this later).

V. THE RELATIVE COSTS OF ECONOMIC AND NON-ECONOMIC CONTAINMENT

Only the very lucky policymaker will end up with zero excess demand for leverage. Let us now consider the case of excess demand for leverage and consider how policymakers might choose between leverage cum non-economic containment and embargo cum non-economic containment, in order to eliminate this excess demand.

The demand for containment may be considered to be a positive function of the excess demand for leverage.[9] We must be careful to distinguish, however, between two containment demand schedules, each one corresponding to a different mixed strategy. One represents the demand for non-economic containment in the event that a leverage cum non-economic containment strategy is followed. The other containment demand schedule represents the combined demand for both types of containment (embargo and non-economic) in the event that trade is embargoed (i.e., whatever leverage is feasible is eschewed).

Clearly, the idea of containment (as opposed to leverage) is to impose economic costs on the adversary's economy. Assume that the "supply" of containment (which bears some positive relation to the attained level of influence over Soviet behavior) is a positive function of such costs imposed on the adversary's economy. Also, we will assume, for simplicity, that the amount of containment supplied for a given level of economic cost imposed on the adversary is the same, regardless of whether caused by embargo or by non-economic containment policies.

Recall that Country A policymakers are assumed to seek to minimize the economic costs to A of attaining some level of influence over B's behavior. These costs are the sum of (1) A's lost gains from trade in the event of embargo, and (2) economic costs to A of non-economic containment (for example, the incremental defense expenditures believed necessary to "contain" the adversary).

Now imagine a benefit-cost ratio for each type of containment: $X=\hat{Y}_B^x/\hat{Y}_A^x$ for the embargo strategy and $Z=\hat{Y}_B^z/\hat{Y}_A^z$ for non-economic containment, where $\hat{Y}_B$ indicates the proportionate cost imposed on B by the respective strategy, and $\hat{Y}_A$ is the proportionate cost imposed on A's economy. (Observe that the benefit-cost ratio for embargo, X, is nothing other than B's relative gain from trade with A.)

Whereas we can imagine some non-economic containment strategy such that the entire demand for containment could be met, at very high costs to both economies, a policy of embargo will only yield a certain loss to the adversary. Consequently, if leverage as a strategy is forsaken for embargo, and if the proportionate gain to B from bilateral trade is less than the proportionate costs to B's economy which must be imposed to attain the desired level of containment, then the embargo must be supplemented with some level of non-economic containment.

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[9] Observe that we are not necessarily assuming that the demand for containment equals the excess demand for leverage. In general, containment and leverage will not be equally effective in attaining the desired level of influence over the adversary's behavior.

Consider the case in which non-economic containment is more efficient than, or at least as efficient as, embargo in terms of minimizing the economic cost to A's economy of imposing any level of economic cost on the adversary. (In other words, $Z \geqq X$.) Clearly, A's policymakers should choose the leverage cum non-economic containment strategy, because leverage imposes no costs on A's economy and non-economic containment is cheaper than embargo.

The choice between the two mixed strategies becomes more complex, however, if embargo has a higher benefit-cost ratio for A than does non-economic containment (i.e., $Z < X$). Which strategy is the most efficient, in terms of minimizing the economic costs to A of achieving some level of influence over B, now depends on the relative magnitudes of several variables.[10] In effect, a strategy of embargo cum non-economic containment will be more attractive to A, relative to a leverage cum non-economic containment strategy: (1) the larger the proportionate gain to B from trade with A, (2) the larger the relative gain to B from this trade, (3) the smaller the supply of leverage available to A, given some level of relative gain to B, (4) the smaller the proportionate gain to A from bilateral trade,[11] and (5) the lower the benefit-cost ratio for non-economic containment.

Even if we were to assume that the West Europeans and the Americans had identical leverage demand and supply schedules (which is unlikely), but that West European perceptions were dominated by "national" concerns, we might expect from the foregoing that the West Europeans would have a greater preference for leverage cum non-economic containment (versus embargo cum non-economic containment) than the Americans. This is because the proportionate gains to the USSR would not be significantly different in the two cases (including grain exports, the U.S. is still one of the largest Western trade partners of the Soviet Union), and yet the relative gain to the USSR would be smaller and the proportionate gains to their own economies would be larger in West European trade with the East than in American trade with that region. The relative strategic preferences of the West Europeans and Americans would also be affected by the "free-rider" phenomenon. If the United States bears a disproportionately high share of the Western Alliance's economic costs of non-economic containment (i.e., a higher share of national income spent on defense), Western Europe in effect would have a higher benefit-cost ratio for non-economic containment (Z) than the U.S. As suggested above, this would only reinforce the West European preference for a leverage over an embargo cum non-economic containment strategy.

The foregoing suggests that the West Europeans could be expected to have a relative preference for the mixed leverage strategy.

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[10] A rigorous diagrammatical analysis is presented in the earlier, more technical version of this paper mentioned on the title page.

[11] The proportionate gain to A could be important here because within some range, the larger are the proportionate economic costs of the embargo, the less likely A's political leaders will be to choose the embargo cum non-economic containment strategy. This is because those sectors of the economy that directly benefit from trade can be expected to fight the embargo, and the larger and more numerous these sectors, the more political influence the pro-trade biased forces will have. The costs of non-economic containment, on the other hand, would be more diffuse over the economy, and some sectors, especially those producing military hardware, would indeed lobby for more rather than less non-economic containment.

That they have not more actively pursued leverage in their dealings with the East in recent years can be explained by (1) a relatively low level of leverage possibilities because the relative gain to the East (particularly to the USSR) has not been that great, and (2) relatively low West European demand for leverage. The latter in part stems from a widespread belief in Western Europe that expanded trade relations will stimulate liberalizing tendencies in (particularly) Eastern Europe.[12] This point of view could be interpreted, of course, as simply a more gradualistic or evolutionary leverage approach, as opposed to the more active and shorter-run linkage of economic and political dimensions which has tended to characterize most recent American East-West trade policymaking.

VI. RECENT DEVELOPMENTS IN U.S. TRADE STRATEGY TOWARDS THE SOVIET UNION

From the late 1940s until the late 1960s, the U.S. trade strategy towards the Soviet Union was essentially one of embargo cum noneconomic containment. To be sure, there had been some relaxation of the scope of U.S. export controls by the late 1960s, and several East European countries, particularly Poland and Romania, had been receiving preferential commercial policy treatment (vis a vis the other communist countries) by the early 1960s. Nevertheless, the basic strategy towards the Soviet Union had remained unchanged for some twenty years.[13]

The embargo strategy of this period can be explained by a high U.S. demand for leverage accompanied by the perception on the part of American policymakers that actual leverage possibilities were few and far between. In part this was because Soviet policies, particularly before the late 1950s, were seen as relatively immutable. The preference for the embargo approach was also reinforced by American perceptions that the relative gain to the Soviets from bilateral trade would be relatively high, while at the same time the proportionate gain to the U.S. would be small. (Recall the discussion in section V regarding the determinants of the preference for one mixed strategy over another.)

By the late 1960s and early 1970s, however, the spirit of detente was in the air. In deciding to embark on a more "intensive" growth strategy and to step up per capita meat consumption levels, the USSR appeared to be commiting itself to permanently expanded imports of technology and grain from the West. The Nixon Administration, recognizing the enormous costs and dangers of U.S. global commitment, as brought home all too clearly by the Vietnam conflict, sought to define a new strategic approach to dealing with the Soviets. The apparent voracious appetite of the Soviets for Western grain and technology, and signs of greater flexibility in the Soviet leadership, led the Nixon Administration to upgrade the perceived leverage possibilities of expanded East-West trade. At the same time, there was a general revaluation of the gains that East-West trade would yield to the American economy. Proponents of expanded East-West trade in the late 1960s and early 1970s frequently argued that the main effect of the American embargo strategy was simply to give away new markets to Western Europe and Japan, which ever since the mid-fifties had been gradually relaxing their own export controls and barriers to imports from the East.[14] Thus the relative gain to the Soviets from expanded bilateral trade was widely perceived as lower than previously.

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[12] See, for example, Bethkenhagen (1982) and Jacobsen (1981).

[13] For an historical analysis of U.S. East-West trade policy, see Wolf (1973).

As our earlier analysis suggests, this combination of perceived enhanced leverage possibilities in general and a perceived smaller relative gain to the Soviets from East-West trade, made a leverage cum non-economic containment strategy more attractive than before. In addition, the weariness with the Vietnam situation had led to a revaluation of the effectiveness of leverage, vis a vis non-economic containment, as a means to influence Soviet behavior. In retrospect, this must be seen more as the result of wishful thinking than cold calculation.

Although the relative appeal of the mixed leverage strategy had grown, then Secretary of State Kissinger had in mind a more subtle strategy than one involving simple and tangible quid pro quos. The "linkage" of expanded trade to Soviet restraint in different parts of the world was seen instead as a very complex process in which the "balance cannot be struck on each issue every day, but only over the whole range of relations and over a period of time".[15] The celebrated "Peterson Report" of 1972 suggested that U.S.-Soviet relations had entered "a new era", and that ". . . closer economic ties bear both cause and effect relationships to relaxation of political tension . . . Once set in motion, the cause-and-effect process can portend a downward spiral in political tension, a mutually beneficial economic foundation for a new relationship and tangible increases in the welfare and safety of the people of both countries".[16]

This rather subtle leverage, or "linkage" strategy, soon came under severe political attack from a number of quarters. First, the very subtlety of the strategy meant that it would encounter widespread and deep skepticism. After a quarter century of Cold War rhetoric and embargo, how could the American electorate suddenly be made tc believe that indeed U.S.-Soviet relations had entered "a new era"?

Second, the very development of trade with the USSR beyond negligible levels meant that the "equity" of the distribution of trade gains would become a potential issue. Given the common perception that the U.S.-Soviet relationship was principally an adversarial one, despite pronouncements of "a new era", the equity issue was almost certain to become more acerbic than in the case of trade with allies or non-aligned countries.[17] The so-called "Great Grain Robbery" of 1972–73 only fanned the flames of the equity issue.

Third, the Kissinger-Nixon strategy came under increasingly heavy attack from both conservatives and liberals. As the Watergate scandal eroded the legitimacy and authority of the second

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[14] Ibid.
[15] Kissinger (1974).
[16] Peterson (1972).
[17] See Wolf (1979) for an expanded discussion of this issue.

Nixon Administration, these attacks became more intense and in the end fatal.[18] Both sides raised moral and human rights concerns regarding trade with the USSR. (Again, as long as U.S. economic relations with the Soviets had been of negligible importance, there had been few moral or humanitarian objections raised to existing U.S. East-West trade policy.) Conservatives attacked the Administration on principle for "trading with the enemy", and on practical grounds for providing absolute trade gains to the Soviets which, in the absence of significant Soviet foreign policy concessions, would simply raise the costs to the United States of noneconomic containment of Soviet influence. Liberals focused more on the "human rights" issue, in effect broadening the strategic arena to include questions of internal dissent and Jewish emigration.[19] The liberal attack on the Kissinger-Nixon concept of détente therefore shifted upward the demand for leverage (and thus increased whatever excess demand for leverage existed in the first place), but also it compressed the leverage time horizon. Indeed, a far less subtle leverage policy was enacted into law with the Jackson-Vanik amendment to the Trade Act of 1974.

Finally, Soviet behavior in this period did not exactly inspire confidence that "linkage" would work. Soviet support for the Yom Kippur War in late 1973 and the rhetorical support it offered to the OPEC embargo and quadrupling of oil prices only reinforced the widespread distrust of detente felt by the American electorate.

Faced with public opposition to and Congressional constraints on the pursuit of non-economic containment policies in the wake of Vietnam, the Carter Administration became increasingly enamored of a less subtle leverage-dominated policy. Early on this Administration quite deliberately broadened the strategic arena. In the light of the slowdown in Soviet growth, continued problems in Soviet agriculture, and predictions that the USSR was on the verge of an energy crisis, the Administration also came to attribute even higher relative gains to the Soviet Union from East-West trade, which exaggerated even more the possibilities for leverage. Samuel Huntington (1978) coined new terms ("economic diplomacy", "conditional flexibility") to conceptualize the new leverage strategy. What the Carter Administration perceived as enhanced prospects for leverage, however, amounted to little more than wishful thinking engendered by increased demand for leverage combined with reduced possibilities for effective non-economic containment.

Only after the invasion of Afghanistan did the Carter Administration significantly revise its perceptions. In effect acknowledging that U.S. leverage potential was small, and that there was little the U.S. could do through non-economic containment actually to "contain" this projection of Soviet power in the short-run, President Carter sought to respond to the rising demand for leverage by an embargo on grain and high technology exports, as well as by the Olympic boycott. More than anything else, these embargoes were meant to reflect American dissatisfaction with the results of detente, and to symbolize the renewed willingness of the United

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[18] See Kissinger (1982).

[19] See Kissinger's interpretation of the combined conservative-liberal attack on detente, in Kissinger (1979, 1982).

States to bear, over the longer-run, the costs of effective containment of Soviet expansionism.

The rapid Soviet military buildup of the 1970s, combined with less Soviet restraint in projecting its influence, has led to a generally heightened American interest in containing Soviet expansionism. The demand for leverage with respect to the USSR is therefore probably greater today than it has been for some time. The experience of the 1970s also suggests, however, that leverage possibilities vis a vis the Soviets have been vastly overrated, whether by "linkage" advocates or by those who preferred a less subtle leverage approach. American East-West trade policymakers in the 1970s, regardless of Administration, consequently had a chronic excess demand for leverage that was not met by an adequate array of non-economic containment policies.

The exaggeration of American leverage possibilities in the 1970s was the result of several factors. First, there was general overestimation of Soviet willingness to make non-economic concessions with respect to either human rights or geopolitical issues. Second, the relative gain to the USSR from bilateral trade was probably overrated. The considerable "leakage" involved with the 1980–81 grain embargo (i.e., G' in expression (2) was not negligible) provides a clear case in point. Third, there was little effective internal coordination of U.S. East-West trade policy. In a sense, the Kissinger-Jackson split over trade policy towards the USSR in the 1972–75 period was yet one more manifestation of the "policy schizophrenia" that has characterized U.S. East-West trade policymaking ever since the late 1950s.[20] In a system devoted to the separation of powers, the inability to fashion a single, consistent policy is not inevitable, but it becomes much more probable. The adversary realizes this, and can to some extent play one side of the domestic struggle off against the other. Finally, it appears that American policymakers may have to be more sensitive to large, vocal economic interests than their Soviet counterparts, at least insofar as trade in agricultural products is concerned. Indeed, if ever there were testimony to the difficulties for a Western democracy in attaining leverage over the Soviet Union (and possibly also of pursuing a long-run embargo strategy), it could be found in the lifting of the grain embargo by President Reagan in Spring 1981, at the same time that the Administration was gearing up to persuade the West Europeans to forgo their own economic gains from the proposed West Siberian pipeline!

With a possibly heightened demand for leverage, but growing perceptions that the supply of leverage has been exaggerated, it is not surprising to find a revival of interest in the embargo cum non-economic containment strategic approach. Increasingly, different voices within the Reagan administration and without have stressed the impact of expanded East-West trade on the Soviets' ability to maintain high rates of growth in defense spending. At least implicitly, these observers are suggesting that providing trade gains to the USSR only means that the U.S. will have to spend even more for non-economic instruments of containment, inasmuch as expanded trade is unlikely to yield significant leverage possibilities. According to this point of view, associated most strongly with Defense Secretary Weinberger, the relative gains to the USSR from trade are actually quite high and this, along with perceived insignificant leverage possibilities, tips the scales toward a mixed embargo strategy. Interestingly, however, this approach runs somewhat counter to the ideological thrust of the current Administration that markets work so well that embargoes in general are likely to be leaky, and hence ineffective.

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[20] See Wolf (1973).

VII. SUMMARY AND CONCLUSIONS

Sections II–V of this paper elaborate a conceptual framework which can be used to analyze and formulate U.S. foreign trade strategy toward the Soviet Union. In essence, U.S. policymakers are assumed to have a certain demand for economic leverage over the USSR, a demand which is positively related to their desired level of influence over Soviet behavior. This desired level of influence in turn is a function of the "breadth of the strategic arena" as perceived by U.S. policymakers. Actual leverage possibilities, on the other hand, are a positive function of the relative gain to the USSR from mutual trade relations, the ability of the U.S. to coordinate internally its trade policies, the relative sensitivity of the Soviet leadership to domestic economic pressures, and the potential mutability of Soviet policies.

Our review of U.S.-Soviet trade relations in the 1970s in section VI suggests that U.S. policymakers are in general likely to be left with excess demand for leverage. In other words, by agreeing to trade with the USSR they will not be able to attain a level and number of "non-economic" concessions from the Soviet leadership which would fully satisfy their desired level of influence over Soviet behavior. Policymakers will therefore have to choose between two broad mixed strategic approaches to trade with the Soviet Union. On the one hand, they can pursue a leverage cum non-economic containment strategy. This entails trading with the Soviets (except for a narrowly-defined core of clearly militarily strategic products and technology), obtaining perhaps some non-economic concessions in return, but augmenting the leverage effect through containment of Soviet influence through diplomatic and military means (in other words, by means of non-economic containment).

On the other hand, policymakers can pursue a strategy of embargo cum non-economic containment. Here, trade with the USSR is generally (although not necessarily completely) eschewed, in the expectation that withholding from the Soviets the gains from trade will in effect raise the economic costs to them of certain types of offensive behavior. Because imposition of a general embargo cannot be expected to "contain" completely Soviet projection of influence, the embargo must also be supplemented by some level of non-economic containment.

Clearly, in any specific instance, the threat of embargo (or the offer to lift it) may serve as the instrument of leverage. Whether the U.S. indeed possesses leverage in such an instance depends on a number of factors, including the bargaining skills and information available to negotiators on both sides. Our time horizon is longer, however, as we assume that in general one can roughly assess the potentialities of a continued commitment to a strategy of leverage. We argue that in general U.S. policymakers should clearly opt for one mixed strategy or another. But adoption of an embargo strategy would not rule out all attempts at leverage, just as pursuit of a leverage approach obviously would not preclude the threat of embargo and even possibly having to occasionally make good on the threat.

The critical importance in all of this of the relative gain to the Soviets from bilateral trade is discussed at length in section III. This gain, defined as the ratio of (a) the absolute trade gain to the USSR relative to its national income, to (b) the absolute gain to the U.S. (Western Europe) relative to its national income, is presented as an important determinant of the very different U.S. and West European viewpoints on leverage possibilities as well as of their own choice between mixed leverage and embargo strategies.

The choice between the two mixed strategies turns on the degree of excess demand for leverage and the relative costs to the American economy of embargo versus non-economic containment. This rather complex issue is discussed in detail in section V. Recent developments in U.S. trade strategy towards the Soviet Union are analyzed in section VI. This analysis, carried out in the context of our conceptual framework, leads us to the following conclusions.

First, there is little evidence of a general Soviet willingness to restrain their behavior as a price for continued high levels of East-West trade. (The lack of direct Soviet military intervention in Poland in 1980–81 may be seen as the exception which proves the rule.) Regarding Soviet-Western competition in the Third World, there is every reason to suppose that nothing, short of a physical incapacity to do so, will deter the USSR from actively offering itself as a support for so-called "national liberation movements".[21]

Second, our review of the 1970s experience suggests that leverage or "linkage" approaches vis a vis the Soviet Union were not as successful as hoped, and that because leverage was meant to provide a good portion of the desired level of influence over Soviet behavior (non-economic containment supposedly providing the rest), the United States indeed failed to contain Soviet influence as much as expected.

Third, the exaggeration of U.S. leverage possibilities and the resultant erratic imposition of specific embargoes, also imposed additional costs on the U.S. economy and strained relations with allies. Moreover, most of these specific embargoes have been widely interpreted as being ineffective, because other sources of supply often made up for the absence of U.S. exports, and because in any event the embargoes usually failed to achieve the leverage objective sought. This devaluation of embargo as a policy instrument, however, has probably been carried too far, because: (1) In most cases specific embargoes have been short-lived, (2) the fact that these embargoes were "leaky" still did not mean that economic costs were not imposed on the USSR, and (3) they were being judged, in most cases, by an unreasonably harsh standard, namely whether they caused a quick change in Soviet behavior.

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[21] See Trofimenko (1981).

Fourth, the relative gain to the USSR is probably quite high in trade with the United States, at least compared to the relative gain the Soviets obtain in trade with Western Europe. Our earlier analysis suggests (sections III and V) that consequently the West Europeans would rationally tend to prefer a mixed leverage over a mixed embargo strategy, but that because they stand to attain so little leverage, they will in effect opt for relatively unconditional trade with the East.

The U.S., on the other hand, would seem to have a more difficult choice to make between the two mixed strategies. Because the amount of attainable leverage on the Soviets is likely to be small (see section VI), U.S. policymakers should probably focus instead on the relative benefit-cost ratios of embargo versus non-economic containment (see section V for a more detailed analysis). In the limiting case, in which continuing leverage possibilities are essentially zero, policymakers should still choose the leverage cum non-economic containment strategy if the benefit-cost ratio for non-economic containment is higher than that for embargo. In stark contrast to the leverage policies of the 1970s, however, they would not place conditions on any trade (beyond embargoing clearly "strategic" core items), and would seek to influence Soviet behavior solely through expanded use of diplomatic and military instruments. On the other hand, should the benefit-cost ratio be higher for embargo, the mixed embargo strategy would be preferred. In effect, in this case embargoing most or all trade would save the U.S. more in terms of non-economic containment expenditures than it would cost in terms of lost trade gains.

We would argue that it is in such a strategic context that the important contemporary specific trade policy issues should be debated. These issues include the direct or indirect American contribution to the West Siberian pipeline and to Soviet energy development more generally,[22] U.S. grain sales to the USSR, and United States' policies towards debt rescheduling in Eastern Europe. Clearly however, the formulation of a U.S. East-West trade strategy for the 1980s must also take into account the direct and indirect strategic ramifications for U.S. relations with Western Europe and for both Western and Soviet relations with Eastern Europe.

APPENDIX

Define Y_A and Y_B as the national income of Country A and B respectively; G as the total gain (to both countries) from mutual free trade; G_A and G_B as the *absolute* gain from this trade to A and B respectively, $g_A = G_A/G$ and $g_B = G_B/G$, so that $g_A + g_B = 1.00$. Also define G' as the post-embargo total gain arising from expanded trade between B and Country C as a result of A's embargo, and G'' as the post-embargo total gain arising from trade diverted by A away from B towards C.

The net absolute gain to B from trade with A, assuming it would share in G' also in proportion g_B, is $g_B(G-G')$. The net absolute gain to A from trade with B, assuming it would share in G'' also in proportion g_A, is $g_A(G-G'')$.

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[22] See Hewett (1982) for a recent analysis of this issue.

B's *proportionate* gain from bilateral trade with A is greater than, equal to, or less than A's *proportionate* gain (i.e., B's *relative* gain is $\gtrless 1.00$) as:

$$\text{(1a)} \qquad \frac{g_B(G-G')}{Y_B} \gtrless \frac{g_A(G-G'')}{Y_A}$$

$$\text{(2a)} \qquad \frac{g_B(G-G')}{g_A(G-G'')} \gtrless \frac{Y_B}{Y_A}$$

If $G''=0$ (as assumed for simplicity in the text), (2a) becomes:

$$\text{(3a)} \qquad \frac{g_B}{g_A}\left(1-\frac{G'}{G}\right) \gtrless \frac{Y_B}{Y_A}$$

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1979-82: THE UNITED STATES USES TRADE TO PENALIZE SOVIET AGGRESSION AND SEEKS TO REORDER WESTERN POLICY

By Jack Brougher*

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SUMMARY*

Throughout the 1970's and into the 1980's the course of American-Soviet trade has been linked closely to the state of overall relations between the two countries. During the three and a half years (1979-June 1982) reviewed in this article the United States has imposed severe sanctions on trade in response to the Soviet invasion of Afghanistan and Soviet responsibility for repression in Poland. After a decade of experience with a fairly significant level of commercial relations with the Soviet Union, the United States approaches trade with mixed sentiments, viewing the U.S.S.R. as a good market for grain, but concerned that trade both contributes to the economic and military strength of a potential adversary and offers the potential for Soviet leverage over U.S. allies.

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The growth of U.S.-U.S.S.R. trade during the 1970's peaked in 1979 at $4.5 billion in combined exports and imports. Exports have consistently far exceeded imports. Four commodities dominate: exports of grain and phosphates, and imports of gold bullion and ammonia. The imposition of sanctions in 1980 and 1981 in response to Soviet aggression severely curtailed the flow of trade.

While the United States and other Western countries vastly increased trade with the Soviet Union during the past decade, the Soviets proceeded with a military build-up and a policy of adventurism. In 1981 the Reagan Administration moved to direct U.S. policy and that of the allies onto a more prudent course minimizing Western vulnerabilities. Winning the agreement of the allies at the Ottawa Summit to consult and coordinate policy on trade with the Soviet Union and other Communist countries, the United States began the process of strengthening the Western system of strategic trade controls and initiated consultations on limiting Western energy dependence and credits vis-a-vis the Soviet Union.

U.S. policy concerns with Soviet energy changed considerably over the past decade, paralleling changes in the state of U.S.-U.S.S.R. relations as well as American assessments of the Soviet energy outlook. An emphasis on promotion of energy-related trade gave way in the late 1970's to a policy of using petroleum technology as a means for exercising leverage over Soviet behavior. In the early 1980's, the United States became seriously concerned about the potential political and economic benefits the Soviet Union gained through energy trade with Western Europe and Japan. Expansion of controls on export of oil and gas equipment and technology to the U.S.S.R. became the most important of the sanctions imposed in December 1981 and June 1982 in response to Soviet responsibility for repression in Poland.

TRADE FLOWS FLUCTUATE WITH SANCTIONS AND SOVIET HARVESTS [1]

During the last decade trade between the United States and the U.S.S.R. rose far above the insignificant levels of the 1960's. Encouraged by both governments and spurred by several poor Soviet grain harvests, turnover reached a record of $4.5 billion in 1979. (See Table 1.) This upward trend was interrupted in 1980 as the U.S. Government imposed sanctions in reponse to the Soviet invasion of Afghanistan, followed by further sanctions in 1981 in response to Soviet complicity in the repression in Poland.

Agricultural products, primarily corn and wheat, dominated U.S. exports during the 1970's and early 1980's, generally accounting for 60–80 percent of total U.S. shipments to the U.S.S.R. They set the pace for the growth of U.S. exports, which rose spectacularly from $118 million in 1970 to a peak of $3.6 billion in 1979. Throughout this period the United States registered large trade surpluses as exports to the U.S.S.R. consistently far exceeded imports. During the last decade for every $4–7 of U.S. exports, the United States imported only $1 worth of Soviet products.

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[1] This section was written by Val Zabijaka, U.S.S.R. Affairs, Europe, International Economic Policy, International Trade Administration, U.S. Department of Commerce.

TABLE 1.—U.S.-U.S.S.R. TRADE: 1971–82

[In millions of dollars]

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982 [1]
U.S. exports (FAS):												
Total	162	542	1,195	607	1,833	2,306	1,623	2,249	3,604	1,510	2,339	3,000
Agricultural	45	430	921	300	1,133	1,487	1,037	1,687	2,855	1,047	1,665	2,300
Nonagricultural	117	112	274	307	700	819	586	562	749	463	674	700
U.S. imports (CV):												
Total	57	96	220	350	254	221	234	540	873	453	347	500
Agricultural	3	4	5	10	7	8	11	13	14	8	13	15
Nonagricultural	54	92	215	340	247	213	223	527	859	445	334	485
Gold bullion [2]								287	549	88	22	100
U.S.-U.S.S.R. trade turnover	219	638	1,415	957	2,087	2,527	1,857	2,789	4,477	1,963	2,686	3,500

[1] Projection.

[2] Gold bullion (nonmonetary gold) was not included in trade statistics until 1978.

Source: Highlights of U.S. Exports and Import Trade (FT-990), U.S. Census Bureau, U.S. Department of Commerce IM 450/455 Microfilm, IM 150/155 Microfilm. Annual data derived from sum of monthly data.

U.S. imports from the Soviet Union remained exceedingly small until 1978, when for the first time gold bullion imports were included in U.S. trade statistics. Gold imports from the Soviet Union assumed major proportions in 1978 and 1979 when they accounted for more than one-half of imports.

Commodity Structure

Unlike American commerce with most developed countries, U.S. trade with the U.S.S.R. consists of a limited range of products. Four components dominate trade: exports of agricultural products (primarily grain) and phosphoric acid, and imports of gold bullion and ammonia. In 1981, for example, these four categories accounted for about 70 percent of bilateral trade turnover. Phosphoric acid and ammonia will assume even more importance if, as planned, their combined total stabilizes at $1 billion per year. In contrast, trade in the other two commodities will probably continue to fluctuate as a result of variations in Soviet agricultural production and in U.S. demand for gold. Over time the fluctuations in U.S. agricultural exports to the Soviet Union may increase even further if, as experts foresee, there is a gradual increase in the variability of Soviet agricultural production. During the four years (1978–81) in which gold bullion has been included in U.S. trade statistics, its share of total imports from the Soviet Union has ranged from 6 to 63 percent.

The product mix of trade has not varied much year-to-year, as Table 2 shows. The top ten U.S. exports and the top ten U.S. imports from the U.S.S.R. for each of the last four years are shown in Tables 3 and 4. These ten commodities accounted for 70–90 percent of U.S. exports and imports. Corn and wheat alone contributed more than half of U.S. exports to the Soviet Union during the 1978–81 period. On the import side, the top two import categories also accounted for more than 50 percent of imports.

TABLE 2.—U.S.-U.S.S.R. TRADE: 1971–81

[In millions of dollars]

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
U.S. exports (FAS):											
Total	162	542	1,195	607	1,833	2,306	1,623	2,249	3,604	1,510	2,339
Food and live animals	16	365	842	287	1,113	1,359	876	1,442	2,283	972	1,600
Beverage and tobacco	1	1	(1)	1	1	1	1	3	2	3	(1)
Crude materials	27	71	78	25	29	141	181	286	564	56	59
Mineral fuels	(1)	None	(1)	1	3	9	17	31	23	26	63
Oils and fats	(1)	2	6	None	14	(1)	(1)	19	73	28	56
Chemicals	38	21	17	28	44	37	40	30	134	31	180
Manufactured goods	10	10	35	27	52	116	89	57	48	25	32
Machinery and transport	63	62	204	225	574	605	374	283	363	269	301
Miscellaneous manufactures	7	9	9	13	26	36	44	98	110	99	46
Other	(1)	1	4	1	2	1	1	1	1	1	1
U.S. imports (CV):											
Total	57	96	220	350	254	221	234	540	873	453	347
Food and live animals	(1)	1	(1)	1	(1)	1	1	2	1	2	3
Beverages and tobacco	(1)	(1)	1	1	1	2	5	5	9	9	6
Crude materials	16	18	12	19	41	49	47	50	33	15	18
Mineral fuels	1	7	77	106	96	54	64	44	16	17	112
Oils and fats	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Chemicals	1	1	2	12	6	6	6	37	68	149	94
Manufactured goods	35	64	123	204	97	85	92	103	160	139	88
Machinery and transport	(1)	(1)	(1)	2	5	4	3	3	4	3	2
Miscellaneous manufactures	3	3	4	4	5	16	10	9	32	29	3
Other	1	1	1	1	1	2	6	287	550	90	23

[1] Less than $500,000.

Sources: "Highlights of U.S. Export and Import Trade" (FT–990), U.S. Census Bureau, U.S. Department of Commerce.

TABLE 3.—10 TOP U.S. EXPORTS TO THE U.S.S.R.: 1978, 1979, 1980, AND 1981

[In millions of dollars]

1978		1979		1980		1981	
Commodity	Value	Commodity	Value	Commodity	Value	Commodity	Value
Corn	1,053	Corn	1,042	Corn	602	Corn	782
Wheat	326	Wheat	812	Wheat	336	Wheat	773
Soybeans	200	Soybeans	489	Tracklaying tractors (344+HP).	51	Phosphoric acid	166
Pressure sensitive tape.	37	Phosphoric acid	93	Soybeans	45	Tracklaying tractors (344+HP).	57
Tractor parts	30	Tallow	58	Pressure sensitive tape.	42	Tracklaying tractor parts.	49
Oil/gas drill mach. parts.	28	Pressure sensitive tape.	50	Tracklaying tractor parts.	39	Tallow	49
Molybdenum ore	26	Molybdenum ore	41	Tallow	28	Tractor parts	35
Tracklaying tractors (344+HP).	26	Barley	31	Petroleum coke	20	Petroleum coke	33
Temperature instruments.	25	Oil/gas drill mach. parts.	28	Phosphoric acid	17	Copper ore	25
Prefab. buildings	20	Tracklaying tractor parts.	28	Almonds	17	Pipe handlers	24
Total	2,249		3,604		1,510		2,339

TABLE 4.—10 TOP U.S. IMPORTS TO THE U.S.R.R.: 1978, 1979, 1980, AND 1981

[In millions of dollars]

1978		1979		1980		1981	
Commodity	Value	Commodity	Value	Commodity	Value	Commodity	Value
Gold bullion	286	Gold bullion	548	Ammonia	95	Fuel oil (light)	81
Fuel oil (light)	40	Palladium	62	Gold bullion	86	Ammonia	78
Aluminum waste	30	Ammonia	56	Palladium	55	Palladium	31
Palladium	28	Nickel	25	Uranium fluorides	35	Nickel	26
Ammonia	27	Metal coins	25	Nickel	35	Naphtha	22
Nickel	24	Platinum group metals, NES.	16	Metal coins	18	Gold bullion	21
Diamonds NOV 1/2 ct.	12	Chrome ore, NOV 40 percent.	11	Palladium bars	12	Uranium fluorides	11
Sable furskins	8	Rhodium	10	Naphtha	10	Fuel oil (heavy)	9
Rhodium	8	Gasoline	9	Uranium compounds	9	Sable furskins	8
Chrome ore, NOV 40 percent.	7	Aluminum waste	9	Platinum bars	7	Platinum group metals.	6
Total	540		873		453		347

Source: U.S. Department of Commerce.

The Impact of Restrictions on the Flow of Trade

Since the mid-1970's the United States has foregone several billion dollars in exports of agricultural products, machinery and equipment to the Soviet Union as a result of U.S. policies established in response to Soviet violations of international norms of behavior:

From 1975 until the imposition of the Afghanistan sanctions at the beginning of 1980, the United States probably lost at least $1 billion in exports as a result of withdrawal of access to Eximbank credits for sales of machinery and equipment to the U.S.S.R. because of Soviet non-compliance with provisions on emigration in the Trade Act of 1974. Soviet officials claimed that $2 billion in contracts was diverted from American to other Western suppliers.

After the imposition of foreign policy controls on exports of oil and gas equipment and technology in 1978, over the next three years U.S. industry lost its share of the Soviet market and, as a result, close to $1 billion in potential sales.

The post-Afghanistan sanctions probably reduced U.S. exports by more than $3 billion in 1980, primarily in agricultural products. The impact on sales persisted even after the lifting of the partial grain embargo, since the Soviet Union continues to turn to other grain suppliers with whom, in several cases, it has signed long-term grain agreements. As a result, in 1982 the United States will forego as much as $3 billion in sales which would have occurred if the Soviets in the absence of an embargo had maintained their overwhelming reliance on U.S. grain.

U.S. firms lost over $850 million in specific contracts with the U.S.S.R. as a result of the December 1981 sanctions. The extension of these sanctions in June 1982 could affect as much as $1.6 billion in business by U.S. subsidiaries and licensees with the Soviet Union over a three-year period.

U.S. Trade Compared With Other Western Countries

Industrialized West (IW)[2] exports to the Soviet Union increased by more than 70 percent from 1975 to 1980, while U.S. exports fell about 20 percent. As Table 5 indicates, Italian exports rose 25 percent over this period, German and Japanese trade increased by more than 50 and 70 percent, respectively, and exports of France and United Kingdom jumped by more than 100 percent.

Total imports by Industrialized Western countries from the Soviet Union increased even more rapidly, tripling over this time. (See Table 6.) Imports by France increased almost five times, while for the Federal Republic of Germany, Italy and UK they tripled. The United States and Japan showed relatively moderate growth, of about 60 and 50 percent respectively.

TABLE 5.—EXPORTS OF MAJOR INDUSTRIALIZED WEST[1] COUNTRIES TO THE U.S.S.R.: 1975–80

[In millions of dollars]

Country	1975	1976	1977	1978	1979	1980
United States	1,834.1	2,306.0	1,623.6	2,249.4	3,604.1	1,509.7
Federal Republic of Germany	2,824.4	2,684.7	2,788.8	3,140.7	3,618.6	4,373.3
France	1,146.9	1,118.1	1,496.3	1,455.5	2,007.5	2,463.8
Italy	1,019.7	981.4	1,227.7	1,133.0	1,219.9	1,271.1
Japan	1,624.4	2,251.9	1,933.9	2,502.2	2,461.5	2,778.2
United Kingdom	458.9	431.5	606.8	811.8	891.1	1,058.9
Total	11,867.0	12,938.0	12,914.1	14,869.8	18,114.3	19,837.5

[1] See footnote 2 in text.

Source: U.N. data.

TABLE 6.—IMPORTS OF MAJOR INDUSTRIALIZED WEST[1] COUNTRIES FROM THE U.S.S.R.: 1975–80

[In millions of dollars]

Country	1975	1976	1977	1978	1979	1980
United States	254.5	220.9	234.6	[2] 272.2	[2] 351.1	[2] 414.9
Federal Republic of Germany	1,295.0	1,701.5	1,852.9	2,489.3	3,883.1	4,036.2
France	771.2	913.7	1,156.1	1,225.2	1,790.4	3,566.9
Italy	879.1	1,364.1	1,444.9	1,534.8	1,902.0	2,987.1
Japan	1,168.1	1,166.2	1,416.3	1,408.9	1,869.1	1,812.4
United Kingdom	526.8	1,196.2	1,362.0	1,328.0	1,760.0	1,825.1
Total	8,063.3	10,178.3	11,622.4	12,888.4	18,503.5	23,019.5

[1] See footnote 2 in text.

[2] Gold bullion (non-monetary) has been included in U.S. trade statistics since 1978.

Source: U.N. data.

1979—ATTENTION CENTERS ON CARTER/BREZHNEV SUMMIT

There had been a general cooling of U.S.-U.S.S.R. relations during 1978 and no movement toward normalization of trade. American businessmen were frustrated by the uncertain climate and their treatment as suppliers of last resort by Soviet trade officials, who claimed U.S. trade discrimination (lack of MFN and credits) and "unreliability" (foreign policy export controls on oil and gas equipment and technology).[3] In 1979 prospects for significantly improving the climate and conditions for trade were linked first with a successful Carter-Brezhnev Summit and, subsequently, with ratification of the SALT II Agreement. Actual trade flows set a new record during 1979, primarily as a result of surges in exports of grain and imports of Soviet gold. American producers of ammonia petitioned for protection from growing imports of Soviet ammonia.

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[2] Belgium, Luxembourg, Denmark, Federal Republic of Germany, France, Iceland, Italy, Netherlands, United Kingdom, Austria, Canada, Finland, Japan, Norway, Sweden, Switzerland, and the United States.

The Vienna Summit and Chances for Normalization

Each of the three American-Soviet Summits held earlier in the 1970's had produced specific initiatives in the economic sphere. In the spring of 1979 there were indications, in addition to progress in SALT II negotiations, that some movement toward normalization of trade might be possible. Jewish emigration from the Soviet Union was proceeding at a record rate. Various senators suggested that after ratification of a SALT Agreement it might be possible to extend one-year waivers for the PRC and the Soviet Union pursuant to the Jackson-Vanik Amendment of the Trade Act of 1974. Subsequently, President Carter said he would favor extension of MFN to both the Soviet Union and the People's Republic of China if it could be done in compliance with existing law (Jackson-Vanik). On the Soviet side, Premier Kosygin said that removal of U.S. trade restrictions could widen economic relations significantly and become an important factor in improving bilateral relations.

In the Vienna Summit Communique of June 1979 both sides confirmed the importance of trade in the development of bilateral ties and agreed to encourage American and Soviet enterprises and organizations to enter into mutually beneficial commercial agreements on a long-term basis. However, it was soon evident that any initiatives on trade would have to await Senate consideration of SALT II. This process moved along slowly and uncertainly as a result of Congressional concern over the Treaty itself and disclosures about the presence of a Soviet combat brigade in Cuba. Some members of Congress made a positive assessment of Soviet emigration performance in 1979 and suggested an Administration initiative to extend MFN to the U.S.S.R. But the Administration decided to put a hold on any submission for the Soviet Union, while going ahead with a waiver request for the People's Republic of China.

Ammonia

Under the fertilizer countertrade agreement signed by Occidental and the Soviet Union in 1973, American imports of Soviet ammonia began reaching substantial levels in 1979. Growing from $27 million in 1978 to $56 million in 1979, they accounted for 34 percent of U.S. ammonia imports. A group of American producers became concerned about the effect of these imports, which were eventually supposed to rise to about $500 million annually, and in

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[3] For a history of U.S.-U.S.S.R. commercial relations 1972 to early 1979, see Heiss, Hertha W., Lenz, Allen J., and Brougher, Jack, "United States-Soviet Commercial Relations Since 1972", "Soviet Economy in a Time of Change," Joint Economic Committee, U.S. Congress, vol. 2, Oct. 10, 1979.

July 1979 they petitioned the International Trade Commission (ITC) for import relief under Section 406 of the Trade Act of 1974. The ITC found in October that imports of ammonia from the Soviet Union were causing, or threatening to cause, market disruption.

On December 11 President Carter, accepting the recommendation of an inter-agency review, announced that he had decided not to provide import relief. Later, however, in the wake of the Soviet invasion of Afghanistan and indications of a Congressional override of his decision, he decided to impose a quota on imports of Soviet ammonia and then remanded the case to the ITC.

In March 1980 the ITC, by a new vote, found that market disruption did not exist, and the quota was lifted. At this writing in mid-1982, imports of Soviet ammonia were expected to top $100 million for the first time and reach as much as $300 million by year-end. Under the 20-year countertrade argeement between Occidental and the U.S.S.R., ammonia sales by the Soviet Union are intended to cover the cost of U.S. equipment and technology used in constructing ammonia production facilities in the U.S.S.R. as well as the ongoing purchase of super phosphoric acid from Occidental.

SANCTIONS ARE PLACED ON TRADE IN RESPONSE TO THE SOVIET INVASION OF AFGHANISTAN [4]

In the last week of December 1979, the Soviet Union invaded Afghanistan. In an address to the nation the following week, President Carter called the invasion an "extremely serious threat to peace" and declared that the Soviet Union could not be permitted to commit this act with impunity. He said that neither the United States nor other nations committed to peace could continue to do "business as usual" with the Soviet Union. Over the following months, sanctions on trade and the Olympics became the focus of the U.S. response to the invasion of Afghanistan.

During his address, President Carter announced that the United States was severely restricting trade with the Soviet Union. He ordered the imposition of restrictions on the export of certain agricultural commodities and products, high technology and other strategic items, and oil and gas equipment and technology. Later he ordered additional sanctions, including embargoes of phosphates and Olympic-related transactions.

The sanctions drastically cut the flow of trade. Whereas U.S. exports to the Soviet Union had been expected to increase significantly in 1980, they instead fell precipitously. They dropped from $3.6 billion in 1979 to $1.5 billion in 1980, about one-third the level anticipated previously. Imports from the Soviet Union, which had been expected to grow moderately, dropped from $870 million to $450 million.

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[4] For further discussion of these sanctions, see Hardt, John P. and Tomlinson, Kate S., "An Assessment of the Afghanistan Sanctions: Implications for Trade and Dilomacy in the 1980's," report prepared for Subcommittee on Europe and the Middle East of the Committee on Foreign Affairs, U.S. House of Representatives, by the Office of Senior Specialists, Congressional Research Service, Library of Congress, April 1981. For documents relating to these sanctions, see Dombroski, Charles, "U.S.-U.S.S.R. Trade Post-Afghanistan: A Listing of Speeches, Press Conferences, and Congressional Testimony," and a 3-volume collection of these documents, U.S.S.R. Affairs Division, EUR/IEP/ITA; U.S. Department of Commerce.

Agricultural Restrictions

In his speech January 4, 1980, President Carter announced that the United States would not deliver 17 million metric tons of grain which had been ordered by the Soviet Union. This amount was over and above the 8 million metric tons of wheat and corn committed under the 1975 U.S.-U.S.S.R. Grains Agreement which the United States would allow to be delivered. In order to permit quick and effective action, exports of all agricultural commodities and products were suspended temporarily.

The partial grains embargo was intended to deny the Soviet Union agricultural commodities and products needed by the Soviets for their livestock sector (Soviet President Brezhnev had reported a disastrous grain harvest in November). The primary commodities embargoed were wheat, feed grains and seeds, soybeans, and animal feeds. Also prohibited were shipments of meat, poultry, dairy products and some animal fats that could be used to replace Soviet livestock products. The new regulations placed these commodities and products, previously freely exportable, under validated license control. This meant that before an exporter made a shipment to the U.S.S.R. he had to apply for and receive prior written authorization (a validated license) from the Department of Commerce. Under the new policy the Department issued only the licenses necessary to permit shipments of corn and wheat to reach eight million metric tons. The Department of Commerce permitted export of commodities and products which did not contribute to the Soviet grain and livestock complex such as furskins, vegetables, fruits, nuts (except peanuts), sugar, coffee, beverages, tobacco, woods, and textile fibers. Subject to a case-by-case licensing review was a third category that included products which under some circumstances might be used for feed or meat replacement, such as live animals, fish, and animal and vegetable oils.

Phosphates

Secretary of Commerce Philip Klutznick announced February 25 that President Carter had ordered an embargo on export, or reexport from other countries, of U.S.-origin phosphate rock, phosphoric acid, and phosphate fertilizers to the Soviet Union. This step was consistent with the grains embargo, since phosphates serve as a source of fertilizer and animal feed supplements. Exports to the Soviet Union of these products had already been suspended in early February when the Department of Commerce instituted a requirement for validated export licenses, and suspended issuance of such licenses. Previously, phosphates could be exported under general license, meaning prior Department of Commerce authorization was not required. This measure affected primarily the Occidental-Soviet phosphates-for-ammonia countertrade deal (discussed above), called by some in the early 1970's a "flag-ship" of U.S.-Soviet détente.

High Technology and Other Strategic Items

President Carter also announced on January 4, 1980, that he was ordering a review of U.S. export licensing policy toward the Soviet

Union and that, pending completion of that review, he was halting exports of high technology and other products that required validated licenses for export to the U.S.S.R. The Department of Commerce suspended processing and issuance of validated export licenses and suspended outstanding licenses, while a review was completed to determine whether any of the latter should be revoked. The Government would also consider putting some additional items under validated license control.

White House Press Secretary Jody Powell explained subsequently that the review was necessary because that the Soviet invasion of Afghanistan had had a major and profound impact on the U.S. relationship with the Soviet Union and, certainly, on U.S. national security considerations. An interagency committee, chaired by Secretary of Commerce Klutznick, reviewed licensing criteria to identify those exports which contribute significantly to Soviet military and warmaking potential.

In March the Government completed its review and adopted new, more restrictive criteria for controlling exports of high technology to the Soviet Union. Controls were tightened on goods such as computers and software and on manufacturing technology critical to the manufacture of high technology defense-related goods. The Government significantly tightened the criteria for reviewing proposals for export of process technology as part of sales of major turn-key plants in militarily relevant industrial sectors. A presumption of denial was established for applications to export technology that could be used to manufacture equipment for oil and gas production. Subsequently, a Commerce official stated that these "changes in the strategic controls are likely to be considerably longer term (than the controls on grain, etc.) and are not likely to be returned to their old levels merely because of a withdrawal from Afghanistan." [5]

Using the new criteria the Government began a case-by-case review of the suspended outstanding validated export licenses. More than 1,000 validated licenses had been returned to the Department of Commerce. The Department of Commerce reevaluated 476 and cancelled the remaining licenses, because they had expired, the goods had been shipped, or the exporter requested cancellation. As of September 30, 1981, 281 of the 476 licenses had been reinstated, 115 had been revoked, 54 had been cancelled, and 26 remained in suspension.[6]

On May 6 Secretary Klutznick announced the embargo of an engine assembly line for the Kama Truck Plant in the Soviet Union. Trucks produced at the plant were used in the invasion of Afghanistan. Licenses for the export of spare computer parts for the plant had been revoked on January 21, 1980.

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[5] Eric Hirschhorn, Deputy Assistant Secretary of Commerce for Export Administration, Remarks before East-West Trade Advisory Committee, U.S. Department of Commerce, Washington, D.C., Oct. 22, 1980.

[6] Office of Export Administration, International Trade Administration, U.S. Department of Commerce, Export Administration Report fiscal year 1981, Washington, D.C. 20230, February 1982.

COCOM

The United States also announced that it would pursue a general no-exceptions policy in COCOM, i.e., one of submitting very few requests for exceptions for export to the Soviet Union of items on the COCOM list of controlled commodities. COCOM is the Coordinating Committee of Western allies which coordinates strategic controls on exports to the Soviet Union, People's Republic of China, and Eastern Europe. Items on the COCOM list are not exported to the Soviet Union unless permission is granted by COCOM after a request for an exception. Consideration for any future exception requests would be given only, on a case-by-case basis, to a limited category: items essential to health and safety, items whose export served Western security interests, items that protected Western access to vital commodities and services, and certain spare parts and servicing for equipment previously exported.

While this policy was not formally adopted by COCOM, the United States succeeded in getting the members to observe a defacto no-exceptions policy. Following consultations, the allies undertook not to allow their companies to replace American firms in sales cancelled by the U.S. sanctions. Meanwhile, the United States worked to develop a common position in COCOM on controls of high technology exports to the Soviet Union. Under Secretary of Defense William Perry stated in February that a nearly completed review of COCOM guidelines had not disclosed many desired changes. However, the United States proposed that special scrutiny be given to sales of turn-key plants valued at $100 million or more, new guidelines on computers already proposed in COCOM be made more restrictive, and that new restrictions be placed on transfer of design, manufacturing and process control technology, including items such as computer software, technical data packages, and technical support.

Olympics—Related Trade Actions

In his speech January 4 President Carter said that both participation by athletes and travel of spectators to the 1980 summer Olympics in Moscow would be endangered by continued Soviet aggressive actions. As the Soviet invasion of Afghanistan continued, the Government acted to discourage participation in the Olympics by American athletes, tourists, and companies. President Carter asked the U.S. Olympic Committee to lead a worldwide effort to move the 1980 summer Olympics from Moscow. He also asked all U.S. companies to cooperate with his call for U.S. non-participation by voluntarily halting the export of products for the Olympics.

At the end of March the President directed Secretary Klutznick to bar exports of goods and technology for the Olympics as well as other transactions and payments. The Commerce Department instituted a requirement for validated licenses for export of Olympics-related goods and announced that licenses would be issued only for medical items.

Additional Steps

The United States took a number of additional actions which dampened economic and commercial relations with the Soviet Union. A meeting of the cabinet-level Joint U.S.-U.S.S.R. Commercial Commission, which oversees bilateral trade, was postponed as were working level meetings scheduled in Moscow to discuss business facilitation matters. U.S. Government-sponsored trade exhibits scheduled in Moscow were cancelled, and the Soviets responded with cancellation of a U.S. show on shipbuilding technology scheduled in Leningrad. Cabinet-level meetings on cooperation in agriculture and health were also cancelled.

Scheduled service to the United States by the Soviet airline, Aeroflot, was limited to two weekly flights. Previously, the number of flights had been expected to increase with the approach of the tourist season. U.S.S.R. fishing privileges in U.S. waters were severely curtailed, with a reduction in Soviet fish allocation by 350,000 tons.

Impact on the Flow of Trade

The sanctions sharply reduced U.S.-U.S.S.R. economic relations. It had appeared earlier that American-Soviet trade would probably set a new record in 1980, with exports rising sharply to approximately $4.8 billion and imports rising to about $1.25 billion. Instead, exports dropped to $1.5 billion, less than one-third the level originally projected, and imports fell to $450 million. (See Table 1.)

U.S. agricultural exports were expected to reach perhaps $3.9 billion, since the Soviets had suffered a poor harvest in 1979 and had given notice that they were interested in increasing their purchases of American grain. As a result of the partial embargo, exports totalled only $1 billion.

The new export licensing criteria reduced high technology exports, which fell from $155 million in 1979 to $85 million in 1980. The high technology items subject to validated licensing requirements consisted primarily of computer systems and other advanced electronic equipment, and automated machine tools.

In 1979 the United States exported $93 million of super phosphoric acid (SPA) and in 1980 these exports were slated to grow to about $400 million. However, the embargo on phosphates held these exports about $380 million below the anticipated level.

Export and import of goods still permitted under U.S. regulations was slowed, but not stopped, by an International Longshoremen's Association (ILA) boycott announced January 9, 1980. The ILA refused to load or unload Soviet cargo and/or ships at ports from Maine to Texas. However, restraining orders were issued in instances where a legal challenge was initiated, and loading subsequently proceeded in many cases. The U.S. Government supported some of these challenges, particularly where shipments were sanctioned by government-to-government agreements. (The ILA lifted its boycott of Soviet cargoes on April 24, 1981 following the lifting of the grain embargo.) The Soviet Union cut drastically its maritime liner service to U.S. East coast and and Gulf ports and shifted much of the cargo traveling between the two countries from Soviet to third-flag vessels. In addition, some exports to the Soviet Union were routed via Canadian ports.

Affect on Business

In at least ten cases the sanctions prevented American firms from carrying out commercial agreements. Immediately affected were Armco, which was not able to go ahead with its $90 million portion of a steel plant contract, and Ingersol Milling, whose export of an $8 million engine assembly line for the Kama Truck Plant was embargoed.

Of much greater magnitude was the potential business foregone as projects went to other Western firms, or were shelved indefinitely. The U.S. share of Soviet orders for Western equipment dropped from a range of between 12 and 20 percent for the late 1970's to a little over 5 percent in 1980. The possibility of acquiring American technology had held a strong attraction for Soviet buyers and had often led to sales of U.S. equipment. Alcoa had been on the verge of signing an approximately $80 million share of an aluminum smelter contract but withdrew just after the Soviets invaded Afghanistan. Among the competitors for a contract to build a production yard for offshore rigs, both J. Ray McDermott and Brown and Root had appeared to be the leaders, but the contract went to the French. Explorative discussions were shelved for four energy-related projects with a combined potential for over $1 billion in sales of U.S. equipment.

The halt of Olympics-related exports and transactions and payments prevented some $35 million in exports and perhaps as much as $20 million in payments by NBC for braodcasting rights. NBC had already indicated that it would not broadcast the Olympics if no U.S. team took part. American firms had agreed to supply to the Olympics items such as track and field surfaces and landing pits, swimming pool accessories, soft drink concentrate and distribution equipment, and TV broadcast equipment. U.S. boycott of the Olympics also resulted in a drastic reduction in the number of Americans who traveled to see the Olympics in Moscow, loss of domestic sales by U.S. firms that purchased the right to use the Olympic logo in the United States, and loss of revenue anticipated from broadcast of the Olympics in the United States.

Imports

Although not affected directly by the sanctions, imports from the Soviet Union fell by almost 50 percent. Gold was the big factor: imports of bullion fell from $548 to $86 million. However, imports of ammonia, which totaled $56 million in 1979, reached $95 million in 1980 as Soviet deliveries increased under the fertilizer countertrade deal mentioned above.

Impact on the Soviet Union

The sanctions denied the Soviet Union some much needed grain, equipment and technology. In some cases the Soviets did not find alternative suppliers. In others, they were able to find alternate suppliers for only a portion of their needs and had to pay higher prices and accept delays.

In August the Department of Commerce, assessing the impact of the new high technology policy along with the no-exceptions policy in COCOM, stated that these measures had impeded and delayed Soviet access to some high technology products, particularly computers. As a result, the Soviets had suffered delays in their planning and construction schedules for major and minor projects.[7]

The Government made the following assessments of the affect of some of the other sanctions when it submitted its report to Congress on December 31, 1980, concerning the extension of U.S. foreign policy export controls:[8]

The partial embargo of grain and other agricultural commodities was expected to have a "marked and adverse effect on Soviet livestock and meat production capabilities." Soviet livestock were under considerable "feeding stress" as a result of the U.S. restrictions and Soviet crop failures. For the first 11 months of 1980, Soviet meat production was about 3 percent below the same period for 1979.

The embargo on U.S. super phosphoric acid (SPA) was expected to delay Soviet development of liquid fertilizer production capability by "perhaps 1 to 2 years." American SPA would have provided about 10–15 percent of the phosphate nutrient content planned by the Soviets in the fall of 1981. The shortfall could reduce crops by 1 or 2 percent annually.

The embargo of an engine assembly line for the Kama Truck Plant delayed expansion of production. Although comparable assembly lines were available in other countries, it appeared that as of the end of 1980 the Soviets had still not contracted for an alternate line.

The restrictions on Olympics-related activities "affected only a limited volume" of exports (some of which were obtained from other countries). As long as the controls remain in effect (on March 1, 1982, they were extended through December 31, 1982), payment by U.S. firms of at least $21 million is prevented to the U.S.S.R. Olympic Committee.

FRAMEWORK IS RETAINED; SOME TRADE CONTINUES

While severely curtailing trade, the Carter Administration made an effort to avoid destroying the economic/commercial framework built up since 1972. None of the sanctions involved abrogating or violating existing government to government agreements. Thus, the United States allowed delivery of the eight million metric tons of grain called for by the 1975 U.S.-U.S.S.R. Grains Agreement in 1979/80 and in 1980/81. The U.S.-U.S.S.R. Maritime Agreement, which included arrangements for shipping grain, was also allowed to stand.

The United States cancelled cabinet-level meetings of the Joint U.S.-U.S.S.R. Agricultural and Health Committees. However, President Carter informed Congress that he had decided to focus restrictive measures against specific activities under bilateral cooperative agreements and not against the framework of the agreements themselves.

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[7] Moyer, Homer E., Jr., General Counsel, U.S. Department of Commerce, Statement before Senate Committee on Banking, Housing, and Urban Affairs, Aug. 20, 1980.

[8] Office of Export Administration, International Trade Administration, U.S. Department of Commerce, Export Administration Report FY 1980, Washington, D.C. 20230, February 1981.

By July 1980 the case-by-case review had been completed for about two-thirds of the suspended validated export licenses and pending applications. About 200 had been reinstated. Among these were several for export of petroleum equipment for the joint Soviet/Japanese Sakhalin Island oil and gas project.

Some business activity continued. American firms continued to receive commercial inquiries from the Soviet Union and signed a little over $80 million worth of new contracts during the first six months of 1980, primarily for heavy equipment such as crawler tractors and parts for super dump trucks.

On December 31, 1980, Secretary of Commerce Klutznik extended for another year the foreign policy export controls for the Soviet Union, thus maintaining in effect the post-Afghanistan sanctions on exports to the U.S.S.R. The United States also decided not to allocate a fishing quota to the Soviets for 1981.

THE REAGAN ADMINISTRATION MOVES TO RECORDER U.S. AND WESTERN POLICY

The Reagan Administration took office in January 1981 convinced of the need for a decisive change in U.S. policy on trade with the Soviet Union. Contrary to the hopes of some in the West that trade could moderate political attitudes and behavior in communist states, the era of detente had been a "period of unprecedented growth of the Soviet military coupled with increased adventurism worldwide." [9] The new Administration stressed that the United States needed a prudent and effective policy based on linkage, i.e., consistency with U.S. political and security objectives vis-a-vis the Soviet Union.

Administration officials warned that current Western trade practices could create potential vulnerabilities. They explained that some Western equipment and technology contributed significantly to the Soviet military buildup; excessive credits, often subsidized, made it easier for the Soviet Union to fund its military buildup and threatened to lead to a situation where a debtor could gain leverage over creditor; dependency by some nations' industries on sales to the Soviet Union threatened market vulnerability; and a proposed gas pipeline project would make Western Europe dependent on Soviet energy and perhaps vulnerable to Soviet pressure. In addition, the grain embargo was criticized as unfair to farmers and ineffective, and the previous administration's handling of strategic trade controls was viewed as ineffective, in large part because of inadequate coordination with allies.

During its first eighteen months the Reagan Administration took steps, which are outlined below, to develop and implement a new policy. This process was influenced in important ways by ongoing efforts to develop a consensus with the allies and by events such as the imposition of martial law in Poland. The United States devoted a great deal of attention to energy-related matters, which are discussed in another section of this article.

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[9] Rashish, Myer, Under Secretary of State for Economic Affairs, Testimony before Senate Committee on Foreign Relations, Subcommittee on International Economic Policy, Sept. 16, 1981.

Lifting the Grains Embargo

After several months of discussion with his advisers, President Reagan on April 24, 1981, carried out a commitment from the 1980 election campaign and lifted the grain embargo. He stated that during the campaign he had opposed the embargo "because American farmers had been unfairly singled out to bear the burden of this ineffective national policy."[10] The President had determined that the United States' position vis-a-vis the Soviet Union was clear and reiterated U.S. opposition to Soviet occupation of Afghanistan and other aggressive acts around the world.

About one year later, President Reagan followed up this action with a pledge not to use farm exports as an instrument of foreign policy except "in extreme situations and as part of a broader embargo."[11] His commitment reinforced the intent of the new Agricultural and Food Act, passed at the end of 1981, which had in effect created a higher threshold for agricultural embargoes. The Act significantly increased the compensation to farmers in the event of an agricultural restriction which is not imposed on all U.S. exports to a specified country where export sales exceed 3 percent of total exports of the commodity during the preceding year.

At the President's direction to lift the embargo, the Department of Commerce removed the validated export license requirements for grain, soybeans, meat and other livestock complex-related products. During consultations under the U.S.-U.S.S.R. Grain Agreement in June, the United States offered additional grain beyond the 8 million metric tons allowed during the partial embargo.

The United States made available to the Soviets 3 million metric tons of corn, 3 of wheat, and indicated that "reasonable quantities" would be available thereafter. On August 3 the United States and the Soviet Union extended the 1976–81 Grain Agreement for one year through September 30, 1982, and agreed to plan for early negotiations on a new agreement (these negotiations were later postponed as part of the sanctions imposed in response to Soviet complicity in repression in Poland).

Following the lifting of the embargo, agricultural exports rose significantly, from $1.047 billion in 1980 to $1.665 billion in 1981, and to a projected $2.3 billion in 1982. However, the U.S. share of the Soviet market remained far below pre-embargo levels. Whereas the U.S. share had amounted to about two thirds in 1977–79, it fell below one third in 1980, stayed there in 1981, and was expected to exceed one-third by only a small amount in 1982 (shares are for fiscal years). Meanwhile, the Soviets continued to increase their total imports of grain in 1981 in the wake of their third poor harvest in a row. American grain sales in 1982 were perhaps $3 billion less than they would have been had the original market share been retained.[12] The Soviets had signed multi-year agreements with other countries, world market supplies were ample, and the Soviets appeared reluctant, at least for the near future, to allow dependence on American grain to reach former levels.

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[10] Statement by the President, Office of the Press Secretary, the White House, Apr. 24, 1981.

[11] New York Times, Mar. 23, 1982.

[12] Block, John, Secretary of Agriculture, Statement before the Senate Committee on Agriculture, Nutrition and Forestry, Subcommittee on Foreign Agricultural Policy, Feb. 5, 1982.

The embargo on phosphates was lifted along with the grain embargo, allowing Occidental to resume shipments under its 20-year fertilizer exchange agreement with the Soviet Union. Phosphate exports rose from $17 million in 1980 (shipped before the embargo), to $166 million in 1981, and are expected to exceed $300 million in 1982, although not attaining the $500 million level envisioned under the agreement.

Linkage

Soon after entering office, the Reagan Administration made it clear that there would be linkage between policy on trade and U.S. political and security objectives vis-a-vis the U.S.S.R. At a speech in New Orleans in the summer of 1981, Secretary of State Alexander Haig alluded to a connection between U.S. economic policy and Soviet willingness to abide by international norms of behavior.[13] Under Secretary of State Myer Rashish explained in September that "economic relations must reflect and reinforce our political goals of influencing the behavior of communist governments in ways which serve the vital interests of the United States and its allies." He stated that if the Soviets acted responsibly and with restraint the United States was prepared to continue, and expand, trade in non-strategic areas.[14]

However, the United States emphasized that it remained prepared to use foreign policy trade controls as part of an overall response to future Soviet aggressive action. On December 13, 1981, martial law was imposed in Poland. On December 29, citing heavy and direct Soviet responsibility for the repression in Poland, President Reagan imposed a number of sanctions on U.S.-U.S.S.R. economic relations (the sanctions are discussed in another section of this article). He also warned that "further steps may be necessary" depending upon Soviet actions. Six months later on June 18, 1982, stating that little had changed concerning the situation in Poland, he strengthened the December 29 sanctions on exports of oil and gas equipment to the U.S.S.R.

Coordination With Allies

Recognizing that despite existing multilateral controls the Soviets could still acquire much of the technology they sought in the West from non-U.S. sources and also concerned about the potential vulnerability of its allies to Soviet economic leverage, the new Administration set out to persuade the allies of the need for changes in policy and improved coordination. U.S. officials stressed that, although this would be a difficult process, the allies could not allow East-West trade to become a source of dissension and division.

At the Ottawa Economic summit in July 1981 the participants agreed, in response to a U.S. initiative, on the need for coordination to ensure that East-West economic policies were compatible with Western political and security objectives. Over the next year the United States followed up with extensive consultations on strengthening strategic trade controls, limiting credits, limiting energy dependence on the Soviet Union, and imposing sanctions in response to Soviet responsibility for repression in Poland.

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[13] Haig, Alexander, Secretary of State, Address before the American Bar Association, New Orleans, Aug. 11, 1981.

[14] Rashish, op. cit.

Export Controls

In the view of the Reagan Administration, the export control systems of the United States and its allies needed much more effective administration. The new Administration directed the CIA to undertake an assessment of the extent to which West-East legal and illegal technology flow had contributed to the buildup of Soviet military capabilities. The CIA reported that the Soviet Union had a massive, well planned, and well managed program for acquiring Western technology that would enhance its military power and improve the efficiency of its military manufacturing technology.

As a result of leakage of technology to the Soviet Union and the consequent erosion of the Western technological edge, vast damage had occurred to Western security. Western technology and equipment had made essential contributions to the modernization of important sectors of the Soviet military-industrial base. The result was that the United States had to spend more money on defense, adding to the burden on the American taxpayer.[15]

During its first months, the Administration conducted a policy review and concluded that it was necessary to tighten restrictions on technology and goods which could upgrade Soviet production in defense-priority industries. Steps were planned to improve the Western system for strategic trade controls as well as the U.S. system.

Multilateral Controls.—Reagan Administration officials stressed that close international cooperation was required to deny the Soviet Union equipment and technology for its military-industrial base. Moreover, multilateral cooperation was necessary to ensure that American exporters were not put at an unfair disadvantage by U.S. controls.

President Reagan took the first step toward strengthening multilateral cooperation when he won the agreement of the Ottawa Summit participants to "consult to improve the present system of controls on trade and strategic goods and related technology to the U.S.S.R." The allies agreed to hold what would be the first high-level COCOM meeting in 25 years. This meeting, held in Paris in January 1982, established the political commitment necessary to strengthen the COCOM system. The United States presented evidence of leakage of strategic technology and made substantive proposals for tightening controls. Under Secretary of Commerce Lionel Olmer stated subsequently that the United States was setting out to control process more than product. In addition, U.S. officials were developing a list of eight or nine defense-priority industries and identifying technologies and products that go into them.[16]

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[15] "Soviet Acquisition of Western Technology," April 1982, submitted by Admiral Inman, CIA, to Subcommittee on Investigations, Committee on Governmental Affairs, U.S. Senate, May 11, 1982; and Lawrence Brady, Assistant Secretary of Commerce, Fred Ikle, Under Secretary of Defense, and Myer Rashish, Under Secretary of State, Statements before Subcommittee on International Economic Policy, Senate Committee on Foreign Relations, Sept. 16, 1981.

[16] Interview with Lionel Olmer, Under Secretary of Commerce, Business International, Apr. 9, 1982.

Some bilateral technical consultations were held following the high-level meeting. In May another meeting was held in COCOM to take up the question of improving enforcement, and harmonizing the export licensing procedures of the COCOM members. A major review of the COCOM embargo lists was scheduled for the fall.

U.S. Export Controls.—The Department of Commerce's Trade Administration moved to improve the effectiveness of U.S. controls in preventing Soviet acquisition of critical technology, with particular emphasis on enforcement.[17] In addition, Secretary of Commerce Malcolm Baldrige emphasized the need to clean up the existing backlog of export licensing cases and help develop a program that would provide business with consistency and predictability in export control decisions.[18]

As efforts proceeded to develop an export licensing policy that would provide consistency and predictability for business, several validated licenses were issued which illustrated the desire of the Administration to allow trade that would not strengthen Soviet military capability and to permit American companies to compete on as equal a basis as possible for exports with other Western firms. At the end of July 1981, the Department of Commerce issued a validated license to Caterpillar for export of 100 pipelayers worth about $40 million, and at the end of November, a license to International Harvester covering export of technology worth up to $300 million for an agricultural combine plant. The Department also took steps to speed up the licensing process, introducing an automated system for processing applications and committing itself to eliminate the backlog of overdue licensing determinations by mid-October 1981.

Credits—The Buckley Mission and the Versailles Summit

In March 1982 Under Secretary of State James Buckley led a mission of State, Commerce, Defense, and National Security Council officials to Western Europe for discussion of allied policy on credits and energy vis-a-vis the Soviet Union. The United States considered it strategically and financially imprudent for the West to continue the uninhibited extension of subsidized official credits to the Soviet Union (the United States had stopped extending official credits to the Soviet Union in 1974). Western government support of financing had enabled the Soviets to expand their borrowing more rapidly and at lower cost than they could have on a commercial basis. In effect, these credits had helped subsidize the modernization of Soviet industry and, hence, of Soviet military capability.[19]

The United States was also concerned that the growing Soviet debt could reach dangerous proportions, particularly in view of the U.S.S.R.'s serious economic problems. As Under Secretary of Commerce Olmer put it: "* * * it would be economic folly for the Western nations to compete with one another in granting more and more government-supported credits to the U.S.S.R. The West would become extremely vulnerable to Soviet financial pressure."[20]

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[17] For a description, see Jacobson, Catherine, Office of Export Administration, Department of Commerce, "The Technology Transfer Issue", Business America, May 31, 1982.

[18] Brady, see footnote 15.

[19] Buckley, James, Under Secretary of State, Statement before Senate Appropriations Subcommittee on Foreign Operations, Apr. 21, 1982.

The Mission conveyed to the allies President Reagan's "deep personal concern over the degree to which official credits have helped strengthen the Soviet Union."[21] In a series of meetings over the next few months the American side sought to get agreement among the Western countries on increasing the exchange of information on official credit extensions to the Soviet Union and on the establishment of a mechanism for restricting such credits. The United States also used the meetings to reiterate concern over the potential for excessive European dependence on Soviet natural gas and to urge that commitments on the Yamal pipeline be kept to a minimum while alternative sources of energy were thoroughly explored.

At the Versailles Economic Summit in June President Reagan urged his counterparts to agree on limiting and raising the cost of credits to the Soviet Union. After extensive discussion, the Summit partners agreed on the need to use caution in handling East-West financial relations, acknowledged a need for limiting credits, and ageed to review periodically lending to the U.S.S.R. and Eastern Europe. At around this time, action taken in OECD increased the cost of government loans for the Soviet Union. The U.S.S.R. was moved to a category ("relatively rich nations") with higher minimum interest rates, and the rates of interest for this category were raised.

In the immediate aftermath of the Summit, some European officials made statements that appeared to the United States to indicate a backing-off from the Summit understandings. Secretary of Treasury Donald Regan said that it had been agreed not to expand credits to the Soviet Union. French President Francois Mitterand indicated that the Summit left each country "sovereignly responsible" for deciding what was prudent and said that France would not further limit credits since it had already effectively done so by raising interest rates. West German Chancellor Helmut Schmidt reiterated the German view that his government did not subsidize credits (in spite of FRG government-backed programs for insuring commercial credits).

NEW SANCTIONS ARE IMPOSED IN RESPONSE TO SOVIET COMPLICITY IN REPRESSION IN POLAND

On December 29, 1981 President Reagan, citing heavy and direct Soviet responsibility for the repression in Poland, imposed a number of sanctions on U.S.-Soviet economic relations. His action followed suspension on December 23 of major elements of the U.S. economic relationship with the Polish government to underscore opposition to the imposition of martial law December 13 and the ensuing suppression of human rights.

At a special meeting of NATO foreign ministers on January 11, 1982, the allied governments endorsed the three criteria on Poland set forth by President Reagan in December: that martial law must be lifted, the detainees released, and a dialogue restored between the government, the Church and Solidarity. They undertook not to undermine the U.S. sanctions and to examine measures which could involve economic and commercial arrangements with the Soviet Union. A few allies took actions such as postponing or downgrading official trade meetings with the Soviets. On March 15, the EC approved restrictions on Soviet manufactured and luxury goods that were expected to decrease imports in 1982 by about $200 million.

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[20] Olmer, Lionel, Under Secretary of Commerce, Speech before the Banker's Association for Foreign Trade, Boca Raton, Florida, Apr. 26, 1982.

[21] Buckley, op. cit.

The U.S. sanctions consisted of the following steps:

Suspension of Aeroflot service;

Closing of the Soviet Purchasing Commission;

Postponement of negotiations on a new U.S.-Soviet long-term Grains Agreement;

Suspension of negotiations on a new U.S.-Soviet Maritime Agreement;

Suspension of issuance or renewal of validated export licenses to the U.S.S.R.;

Expansion of the list of oil and gas equipment and technology requiring a validated export license, and suspension of the issuance of such licenses; and

Non-renewal of some exchange agreements on energy and technology.

Aeroflot

The Department of State, in cooperation with other federal agencies, suspended Aeroflot service after January 3 until further notice. Under the U.S-Soviet Civil Air Agreement of 1967, which remained in effect, the United States was no longer obligated to permit any specific number of flights by the Soviet airline, because the U.S. carrier, Pan American, had eliminated its service between the United States and the Soviet Union in October 1978. Since early 1980 Aeroflot had operated two weekly flights between Moscow and Washington. It carried approximately 11,000 round-trip passengers in 1980 and 19,000 in 1981.

Purchasing Commission

The Department of State notified the Soviet Purchasing Commission that it would have to close by January 13. The Commission (formerly Kama Purchasing Commission) had operated in New York since 1973. As an arm of the U.S.S.R. Ministry of Foreign Trade, the Commission placed orders for U.S. machinery and equipment, initially for the Kama River Truck Plant. Permission for establishment of the Commission was extended in 1972 by the Secretary of Commerce simultaneously with an undertaking by the Soviet Foreign Trade Ministry to accredit offices of U.S. companies in Moscow. U.S. operating authority for the Purchasing Commission in the United States was renewed periodically, most recently until April 1982.

The Purchasing Commission was responsible for about $1.5 billion in exports of U.S. equipment and services for various Soviet projects, including an industrial tractor plant, an ammonia production complex, and the Moscow World Trade Center. These purchases represented about one-third of Soviet orders for U.S. non-agricultural goods. Purchasing activity by the Commission had been at a low level since imposition of U.S. trade sanctions in response to the Soviet invasion of Afghanistan.

Grain

Postponement of negotiations on a new long-term Agreement did not affect existing arrangements for sales or shipment of grains. This trade was proceeding under the terms of a one-year extension of the 1979 U.S.-Soviet Grain Agreement valid until September 30, 1982. The Soviet Union was committed to buy 6 million metric tons of wheat and corn annually, and the United States was obligated to permit shipments to the Soviet Union of up to 8 million tons. In October 1981 the United States had informed the Soviets that they could buy up to 15 million tons in addition to the 8 million tons during the 12-month period ending September 30, 1982. Soviet purchases of U.S. grain continued after the postponement of negotiations, totalling about 3 million tons in the first three months of 1982, for a total of about 14 million tons for the current year of the Grain Agreement.

Maritime Agreement

The United States had been engaged in negotiations toward a new Maritime Agreement, with the most recent meeting ending inconclusively in early December. These negotiations were now suspended. Under the 1975 Maritime Agreement, which expired December 31, 1981, merchant vessels of the Soviet Union had had access to 40 U.S. ports on the basis of four days advance notice. The Soviets now were required to request permission for their ships to call at a U.S. port at least 14 days in advance. Decisions on Soviet requests were to be made on a case-by-case basis with an effort to avoid inconveniencing U.S. exporters. The United States took a restrictive approach toward requests for Soviet ships engaged in traffic, including passenger service, between the United States and third countries. In 1981 there were 280 port calls by Soviet ships, compared with 406 in 1980 and 1,383 in 1979. These figures reflect the decline in U.S.-Soviet trade in 1980 following the post-Afghanistan sanctions and the International Longshoremen Association's boycott.

High Technology

The Commerce Department published regulations suspending the processing of applications for validated licenses for export to the U.S.S.R. effective December 30, 1981. Under the Export Administration Act, the Department maintains lists of specific items—products, technical data, and services—which require validated licenses before being exported to the Soviet Union. No new licenses would be issued for export or reexport of this high technology or of oil and gas equipment. About 240 license applications worth $130 million were pending to the U.S.S.R. Industrialized Western countries exported about $2.3 billion worth of "high technology" products to the U.S.S.R. in 1980. The United States exported about $85 million of these products, or about 4 percent of the Western total.

Oil and Gas

The Commerce Department expanded controls governing the export of oil and gas equipment and technology to the Soviet Union. Equipment and technology in the petroleum exploration and production areas had required validated licenses since 1978. New regulations effective December 30, 1981, required export licenses for a variety of additional products, equipment and technical data for the transmission or refining of petroleum or natural gas. On the same date the Department suspended action on all applications for export of oil and gas equipment and technology along with other items under validated license control. In a further step to encourage reconciliation in Poland, President Reagan on June 18, 1982 extended these controls to include equipment produced by U.S. subsidiaries abroad as well as equipment produced abroad under license arrangement with U.S. companies (see section of this article dealing with energy).

Cooperation Agreements

The United States announced its intention not to renew U.S.-Soviet Agreements on Space, on Energy and on Science and Technology due to come up for renewal in May, June and July 1982, respectively. At the time of the sanctions eleven bilateral exchange and cooperation agreements were in effect with the Soviet Union, including programs covering agriculture, environmental protection, housing, health and transportation. Following the Soviet invasion of Afghanistan the United States had severely curtailed activities under these programs, continuing only low-level exchanges.

Extension and Expansion of Foreign Policy Controls

On March 1, 1982, the United States extended through January 20, 1983, existing foreign policy controls on exports to the U.S.S.R., including the post-Afghanistan invasion restrictions on activities in support of the 1980 Moscow Summer Olympics. In addition, the foreign policy control on export of a diesel engine assembly line for the Kama truck plant was extended to the ZIL Truck Plant and expanded to cover additional commodities used in truck production.

ENERGY REMAINS A CENTER OF ATTENTION, ALTHOUGH THE FOCUS CHANGES: 1971–82

Introduction

The focus of U.S. policy on energy-related trade with the Soviet Union changed dramatically over the last decade. In the early and mid-1970's attention focused on commercial cooperation in energy as one of the best opportunities for building a significant level of two-way trade. In the late 1970's the U.S. Government took measures to use American petroleum technology for leverage over Soviet behavior in non-trade areas. By the early 1980's the United States had become concerned about the potential leverage and hard currency earnings which could become available to the Soviet Union as a result of its energy trade with Western Europe.

The evolution of U.S. policy concerns paralleled changes in the state of overall U.S.-Soviet relations as well as American perception of the outlook for Soviet energy production and trade. In the early 1970's, when the Nixon-Brezhnev Summits brought improvement in overall relations, the search for possible areas of cooperation centered on trade. At this time the Soviet Union was on the way to becoming the number one oil producer in the world, a position it achieved by surpassing the United States in 1974. Many Soviet and Western observers assumed that oil, along with other Soviet fuels, would continue its rapid growth for many years. In 1977 President Carter, in announcing his proposals for a U.S. National Energy Plan, revealed that the CIA was predicting that Soviet oil production would level off and decline and that by 1985 the Soviet Union would become a substantial oil importer.

U.S.-Soviet relations had reached a low ebb in the summer of 1978 (in part because of Soviet persecution of dissidents) when the United States placed exports of oil and gas equipment and technology to the Soviet Union under validated license control in order to signal objection to Soviet actions and gain leverage over Soviet policy. By 1981, when the Reagan Administration raised concerns about Western European dependence on Soviet energy, the growth of oil production in the U.S.S.R. had begun to slow. The Soviet Union was now emphasizing the role of natural gas in planning the expansion of domestic energy consumption as well as energy exports to Western and Eastern Europe. At the end if 1981, as part of its response to the Soviet role in repression in Poland, the United States ceased issuing validated licenses for export of oil and gas equipment to the Soviet Union and later expanded its sanctions to cover foreign subsidiaries and licensees as well.

Energy-Related Trade

In the early 1970's businessmen began to explore the potential for American sales of petroleum equipment and technology and imports of energy from the Soviet Union. The United States was the world's preeminent supplier of petroleum equipment as well as a major energy importer, while the Soviet Union possessed vast reserves of gas and oil.

Oil.—In 1973–74 a major American oil company believed it was close to reaching an agreement with the Soviets covering exploration and development of oil off the coast of Sakhalin Island. However, an agreement was not signed, and instead the Soviets and Japanese concluded an agreement in 1975 covering exploration, production, and purchase of oil off part of the coast of Sakhalin. Gulf Oil took a small capital interest in the Japanese consortium. Some U.S. equipment was purchased or leased for the project. In 1982 a portion of scheduled exploration work was expected to be delayed as a result of the denial of U.S. equipment by the December 29, 1982 sanctions. (See above.) At various times during the 1970's American and other Western oil companies discussed additional proposals for development of offshore oil, but the Soviets were apparently not ready to go forward with these projects nor willing to offer the Western companies adequate management participation or revenue.

LNG (Liquefied Natural Gas) Projects.—Beginning in 1971, consortia of U.S. companies carried on discussions with the Soviets for much of the decade on two countertrade projects which envisioned combining in one package American exports of gas equipment and technology with long-term imports of Soviet natural gas. The North Star project and the Yakutia project called for development of new gas deposits in Siberia, construction of pipelines and gas liquefaction facilities, long-term shipment of liquefied gas to the United States, regasification of the gas, and distribution to American consumers. At this time the Soviets were building facilities for a series of somewhat similar gas-for-pipe deals with Western European firms which had been concluded in the late 1960's.

The proposed *Yakutia* project evolved as a trilateral Soviet-Japanese-American project with Occidental Petroleum and El Paso LNG representing the American side. The parties broke the project into two phases: (1) exploration, involving confirmation of 35 trillion cubic feet of gas reserves in the Yakutia area of the Soviet Far East, and (2) development—including development of the gas field, construction of a pipeline (to a Soviet Far East port), liquefaction and other facilities, and LNG tankers; construction of regasification facilities in the United States; and, finally, long-term delivery of the gas. A general agreement covering exploration was signed in 1974. Participation by U.S. Eximbank, originally envisioned by the parties, was precluded by passage of the Trade Act of 1974 and Soviet refusal, announced in 1975, to comply with its provisions on freedom of emigration. Subsequently, the parties reduced the commitment of Western credits for purchase of equipment for exploration, from $100 million to $50 million, and arranged for support by Bank of America, Japan Eximbank, and private Japanese banks.

As the Soviet reported progress in confirming the stipulated volume of reserves, the three parties continued to meet and work on tentative plans for pursuing development. In 1980, however, El Paso LNG discontinued further discussion of Yakutia, and no new developments have been reported since. In the course of discussions during the 1970's, Japanese participants had indicated several times that they considered American involvement necessary for their participation. Meanwhile, the Soviets concentrated their investment in gas development far to the West in Western Siberia, an area much closer to Moscow and Western Europe.

The *North Star* project, which American firms began discussing with the Soviets in 1971, evolved through several phases but never reached the contract stage. North Star was similar in concept to the Yakutia project but called for development of gas in northwest Siberia and delivery to the U.S. East Coast. When, as described above, it became clear that U.S. Eximbank financing was out of the question, the American consortium developed a version of the project called North Star International. This arrangement called for West European financing for equipment purchases by the Soviets, and French and American purchase of the LNG. The project never came to fruition. The Urengoy field in northwestern Siberia, which was originally envisioned as the source of gas for the project, began producing in 1978. By the late 1970's the Soviets planned to make it the source for the proposed Yamal West European-Soviet pipeline, which they hoped to complete in the mid-1980's.

A combination of economic and political factors accounts for the fact that a decade after the initiation of discussions neither the Yakutia nor the North Star project had come to fruition in a form involving American participation. Throughout much of the 1970's the Government did not enunciate a clear policy on LNG generally. In addition, U.S. Administrations and Congress had had serious misgivings about the projects which were expressed, respectively, in the withholding of final policy judgments and a severe limitation on the extension of Government-backed credit. The Soviets had proceeded very slowly, using discussions of these projects in their economic planning process, and subjecting the projects to the delays of that process. The necessary Soviet investment of labor, equipment and allocation of limited hard currency earnings and credits could not have been made available for some time. Other projects materialized, such as the Soyuz (formerly Orenburg) and Yamal pipelines to Eastern and Western Europe, respectively. These pipeline projects involved partners who were located closer geographically and were not subject to the political constraints of the American firms. They were also less complex and less expensive than the proposed LNG projects.

Importation of Soviet Fuel.—Soviet exports of fuel to the United States rose during the 1970's and assumed an important place in total U.S.S.R. exports to United States. (See Table 2.) However, they never played a significant role in the economic life of either country. These sales only once amounted to as much as one percent of Soviet exports of oil to the West and never as much as one percent of U.S. imports of oil. In 1975–76 American and Soviet negotiators met in Moscow and Washington for several months in an attempt to negotiate an oil purchase agreement which was envisioned as a companion to the long-term Grain Agreement signed in 1975. The amount of oil proposed was relatively small (about 200,000 barrels per day) compared to total American imports (about 6.5 million barrels per day). The negotiators never came close to an agreement. The Soviets had ample markets closer to home and declined to offer discounts on either sales price or transportation. In the absence of a discount there was no incentive for American firms to choose to import Soviet oil rather than oil from other countries.

Sales of Petroleum Equipment.—While efforts to develop massive LNG projects and an oil purchase agreement stalled, sales of American petroleum equipment to the Soviet Union forged ahead. Petroleum equipment suppliers mounted all-U.S. exhibitions in Moscow in 1973 and 1977. U.S. exports of oil and gas equipment rose rapidly from $11 million in 1972 to a peak of $164 million in 1979 (see Tables 7 and 8), before dropping in 1980 and 1981. In addition, American firms sold about $60 million in geophysical processing equipment (not included in Tables 7 and 8) to the Soviets during the 1970's.[22] Petroleum equipment became one of the leading nonagricultural exports to the U.S.S.R. The drop in petroleum equipment exports in 1980 came as the result of foreign policy export controls imposed in 1978 and the post-Afghanistan sanctions imposed in 1980. During 1980, in the wake of the sanctions imposed on trade in response to the Soviet invasion of Afghanistan, a scheduled third U.S.-only exhibit of oil and gas equipment evolved first into a U.S. show with a European section, and finally became a European show with a few American participants.

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[22] McHenry, William K., and Goodman, Seymour E. "Soviet Seismic Data Processing: Prospects for the 80's", Oil and Gas Journal, Mar. 29, 1982.

TABLE 7.—U.S. EXPORTS OF OIL AND GAS EQUIPMENT TO THE U.S.S.R.: 1972–77 [1]

[In millions of dollars]

Description	1972	1973	1974	1975	1976	1977
Rubber Tape	None	([2])	([2])	None	3.7	8.8
Carb Stl Line Pipe, Smls	None	None	None	None	6.5	6.1
Carb Stl Oil Ctry Goods, Smls	None	5.1	1.3	None	2.8	([2])
Borng and Drill Mch Mining etc	None	None	None	2.0	2.4	([2])
Mining Mchy, Nec	None	None	None	3.0	5.0	.2
Oil Well Drill Mac Rot	None	None	None	.4	None	1.0
Well Drilling Mch Parts, etc	2.0	.5	.2	1.0	3.7	7.2
Oil Well/Field Pumps F Lqds	.1	17.7	4.5	11.7	22.2	3.7
Pts and Attach Nec, Pmps, Lqds	([2])	.8	2.5	5.9	8.2	11.7
Oil Fld Equip Nec, Pts Nec	1.3	7.8	None	None	3.0	5.3
Lift and Load Mchs Nec Pts	None	45.5	8.3	5.5	11.2	4.0
O/G Fld Wr Ln and Dwn Hl Equip	2.3	2.2	3.5	5.9	1.2	4.8
Geophy Pros App	([2])	.3	.3	2.2	1.0	.5
Elec Instr for Nonelec Qty	.4	.3	1.0	1.1	.9	.5
Arc Weldrs Ac Transformer	None	None	([2])	2.1	1.7	2.0
Pts and Acc Nec for Arc Weldrs	([2])	.4	.1	.4	.4	1.2
Press Sens Tape Plastic	1.7	2.9	3.5	6.5	21.0	21.3
Total of above	7.8	83.5	25.2	47.7	94.9	78.3
Other [3]	2.8	7.2	28.5	9.4	13.0	13.7
Total	10.6	90.7	53.7	57.1	107.9	92.0

[1] Because the schedule B coding base of U.S. exports (including oil and gas machinery and equipment categories) was redefined in 1978, two separate tables have been used.

[2] Less than $50,000.

[3] All other products, none of which amounted to $1 million during any given year during this period.

Source: U.S. Department of Commerce, Bureau of Census, EM 522, U.S. Exports, Schedule B, Commodity by Country of Destination, a compilation from monthly reports 1972–81, published Washington, D.C., U.S. Government Printing Office.

TABLE 8.—U.S. EXPORTS OF OIL AND GAS EQUIPMENT TO THE U.S.S.R.: 1978–81 [1]

[In millions of dollars]

Description	1978	1979	1980	1981
Rot Drill Mch, Oil & Gas	5.2	9.0	None	None
Drill and Boring Mch, Nspf	None	11.2	None	None
Pts Nspf Oil/Gas Drill Mch	27.8	28.2	1.1	7.2
Pts Nspf Boring/Drill Mch	1.9	3.0	.5	.2
O/G Fld Wr Ln and Dwn Hl Equip	None	.2	1.0	2.3
Weldg and Cutting Mch, Nspf	.1	1.3	.6	.2
Oil Well and Oil Fld Pumps	1.2	10.0	([2])	None
Pts Nspf of Pumps for Lqds	.2	17.6	.1	.2
Pts, Air and Gas Compressors	1.7	None	None	None
Pts, Air and Gas Compress, Nspf	None	3.1	2.9	2.1
Pipehandlers (pipelayers)	3.8	23.9	None	24.4
Pts Nspf Loading Mch etc	None	1.4	1.2	5.5
Geophys Inst and Pts, Elec	.7	2.0	([2])	.1
Press Sens Tape, Plastic Bkg	36.6	50.1	42.2	19.7
Total of above	79.2	161.1	49.8	61.9

TABLE 8.—U.S. EXPORTS OF OIL AND GAS EQUIPMENT TO THE U.S.S.R.: 1978-81 [1]—Continued

[In millions of dollars]

Description	1978	1979	1980	1981
Other [3]	3.6	3.0	1.3	1.6
Total	82.8	164.1	51.1	63.5

[1] Because the schedule B coding base of U.S. exports (including oil and gas machinery and equipment categories) was redefined in 1978, two separate tables have been used.

[2] Less than $50,000.

[3] All other products, none of which amounted to $1 million during any given year during this period.

Source: U.S. Department of Commerce, Bureau of Census, EM 522, U.S. Exports, Schedule B, Commodity by Country of Destination, a compilation from monthly reports 1972-1981, published Washington, D.C., U.S. Government Printing Office.

Pipelayers, components for gas pipeline compressor stations, pressure sensitive tape for wrapping pipeline, submersible oil well pumps, and drilling and offshore equipment have constituted the major U.S. petroleum equipment exports. (See Tables 7 and 8.) U.S. firms also sold a $148 million plant for production of drill bits and a $25 million plant for production of subsea completion equipment. Sales have fluctuated widely. For example, exports of oil well pumps reached $18 million in 1973 and $22 million in 1976. They were expected to continue climbing, since Soviet requirements for lifting oil and water from deposits grew as the result of the extensive use of water flooding to accelerate oil production. However, these exports fell off as the Soviet Union made-do with its own pumps and began importing gas lift equipment to help with fluid lifting requirements. U.S. firms also did substantial business related to gas pipeline compressor technology, both through direct exports of equipment to the Soviet Union and as subcontractors of manufacturing technology and components for European firms.

The United States quickly became one of the most important sources for growing Soviet purchases abroad of oil and gas equipment. For machinery for oil and gas drilling, production and processing, the United States was the leading foreign supplier in 1975 and the second leading supplier, behind Romania, in 1977 and 1979.[23] In competition for Soviet orders for the full universe of oil and gas equipment and technology, i.e., for exploration, production, transmission, and refining as well as for plant to produce such equipment, the United States during the 1970's generally ranked at least second or third among Western countries, sometimes behind France or West Germany. In these years the United States garnered anywhere from about 15 percent to 45 percent of the market. In 1980 the U.S. share amounted to about 5 percent and in 1981, about 1 percent.

Energy Technology for Foreign Policy Leverage

In April 1977 President Carter announced that the CIA had recently concluded that the Soviet Union, the world's largest oil producer and a major exporter, would become a substantial importer of oil by 1985. The CIA believed that Soviet demand for Middle Eastern oil would play a role in pushing demand for oil substantially above world supplies. A report released by the CIA a few months later described the growing role of Western, particularly American, equipment and technology in the Soviet oil and gas industry.[24] Some experts questioned whether the constraints facing the U.S.S.R. oil industry were as severe as portrayed by the CIA, and most did not believe that the Soviet Union would choose, or be able, to import as much oil as the CIA originally predicted.[25] However, all agreed that Soviet oil and gas developments would have implications, perhaps significant, for the United States and other Western countries as the result of their impact on the international oil market and Soviet relations with the Middle East.

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[23] Ministry of Foreign Trade of the U.S.S.R., Vneshniaia torgolia SSSR, Volumes for 1971-80, Moscow.

In a way, the Soviets had become victims of their own success. They had succeeded in tremendously accelerating the production of oil and using this oil to fuel domestic economic growth, enhance leverage over Eastern Europe, and increase imports of goods and services from the West. The Soviet and Eastern European economies had come to rely on an ever growing supply of oil. For several reasons, the Soviets now faced a tremendous challenge in continuing this growth or even in simply maintaining the current level of production.

Soviet actions began to demonstrate a recognition that problems existed. In 1978 Communist Party General Secretary Brezhnev said that for the next 10 years the Soviet Union would rely primarily on Western Siberia for energy and confirmed that a decision had been made to vastly increase the already massive allocation of manpower and equipment for that area. Soviet projections of future drilling requirements increased dramatically.

Imposition of the Oil and Gas Controls.—One year after the issuance of the CIA report, the White House discussed the possibility of using American preeminence in the field of petroleum technology as a policy tool for influencing Soviet behavior. A Presidential Directive signed in August 1977 had stated that the United States must take advantage of its economic strength and technological superiority to encourage Soviet cooperation.[26]

While these discussions were underway, the Soviets took several actions to which the United States strongly objected: in a general crackdown the U.S.S.R. convicted and sentenced two leading Soviet dissidents, and they also arrested an American businessman and convicted two American reporters of "slander and defamation." White House officials announced on July 18, 1978, that an export license for a Sperry Univac computer was being denied and that controls were being imposed on exports of oil technology to the Soviet Union. On August 1 the Department of Commerce placed under validated license control exports to the Soviet Union of equipment and technology for exploration and production of oil and gas, and for manufacture of such equipment. Previously, this equipment had been exported freely under general license.

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[24] Central Intelligence Agency, "Prospects for Soviet Oil Production, a Supplemental Analysis," ER 77-10425, July 1977.

[25] United States Senate, Staff Report of the Senate Select Committee on Intelligence, May 1978.

[26] Huntington, Samuel P., "Trade, technology, and Leverage: Economic Diplomacy", Foreign Policy, Fall, 1978.

Administration officials stated that this action did not constitute a ban on export of oil and gas equipment and technology to the U.S.S.R. Rather, it was a requirement that proposed exports be submitted for review by the National Security Council and, ultimately, for Presidential approval. Samuel Huntington, who had been involved actively in the National Security Council in designing this measure, explained several months later after leaving the White House, that approval or disapproval of an export would depend, among other things, on the overall state of U.S.-U.S.S.R. relations and whether, in the language of the Export Administration Act, the export would "further significantly the foreign policy of the United States." The purpose of the control was to provide President Carter with a tool for creative and flexible economic diplomacy with the Soviet Union.[27]

Licensing policy.—After imposition of the controls in August 1978, no policy was announced regarding the U.S. position on development of Soviet energy generally, or the specific question of American participation.[28] Applications for licenses to export oil and gas equipment and technology to the U.S.S.R. were handled on a case-by-case basis with no publicly announced guidelines. No applications were denied for the next 15 months, up to the Soviet invasion of Afghanistan. Exports of American oil and gas equipment to the Soviet Union continued, even achieving a new high in 1979, but the U.S. share of new contracts for future delivery dropped significantly.

From August 1978 through September 1981, the Department of Commerce licensed about $430 million worth of petroleum equipment for export to the U.S.S.R. In addition, about $15 million worth of geophysical and mineral inspection instruments were licensed from October 1979 through September 1981, the only period for which figures are available.[29] Actual U.S. exports were less than these totals, because in some cases firms never signed sales contracts with the Soviets for the licensed goods.

The fate of the Dresser drill bit plant contract illustrated the difficulty of applying the new procedure in the absense of a U.S. policy position on Soviet energy. Dresser Industries, after several years of negotiation, had signed a $150 million contract with the Soviet Union in early 1978 to supply a plant to produce "rock bits" for oil and gas drilling. The Department of Commerce issued a validated license to Dresser in May covering export of the basic technical data for the project. Tungsten carbide manufacturing technology, which is used to make inserts for drill bits, also can be applied to the production of armor piercing shells. It was the assessment of the Department of Defense that the Soviets had possessed tungsten carbide technology for more than ten years, probably already had adequate production capability for tungsten carbide penetrators, and clearly needed the Dresser technology for the purpose of producing drill bits.[30] A second license, for a computer controlled electron beam welder, was approved in August after the imposition of the oil and gas controls. Both of these licenses were required by the Government under the national security authority of the Export Administration Act, even before imposition of the oil and gas controls.

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[27] Huntington, Ibid.

[28] Perry, William, Under Secretary of Defense, Testimony before Permanent Subcommittee on Investigations of the Senate Committee on Governmental Affairs, October 3, 1978.

[29] Office of Export Administration, Export Administration Annual Report, FY 1981, FY 1980, Semiannual Reports, April 1979-September 1979, October 1978-March 1979, and April 1978-September 1978.

[30] Perry, op cit.

As White House officials announced the new oil and gas controls on July 18, 1978, they also mentioned that the Dresser sale would be allowed to go forward. However, the sale was now subjected to new scrutiny. Senator Henry Jackson expressed strong opposition to this export. The Pentagon asked its civilian Defense Science Review Board to study the sale and received a recommendation against it. The report said that drilling technology could assist the Soviet Union to develop its resources independent of further U.S. and Western support, and the Pentagon recommended that export of the plant be halted pending a review of overall U.S. policy toward Soviet petroleum development.

At the end of August President Carter announced that he would review the Dresser export licenses. However, a week later he reaffirmed approval. Two years later, in October 1980, the Department of Commerce revoked the technical data license, pursuant to a new policy invoked with the post-Afghanistan sanctions. (See below.) At that time most of the technical documentation had been delivered to the Soviet Union by Dresser, while some training and technical consultation remained outstanding. The plant began large-scale production in 1982.

Ban on export of oil industrial technology.—In March 1980, the Department of Commerce announced a new policy under which there would be a presumption of denial for applications to export industrial technology for manufacturing oil and gas production and exploration equipment to the Soviet Union and a presumption of approval for end-use equipment only. Validated export licenses for oil and gas equipment and technology had been suspended in January along with all other validated licenses for the Soviet Union as part of the post-Afghanistan invasion trade sanctions. Using the new policy guidelines, the Government began reviewing on a case-by-case basis the suspended validated licenses and applications for licenses.

In November 1980 Secretary of Commerce Philip Klutznick announced the approval of a license for Caterpillar to export 200 pipelayers worth about $80 million to the Soviet Union for the proposed Western Europe-U.S.S.R. Yamal gas pipeline. Among the considerations leading to the decision, Secretary Klutznick cited the importance placed on the project by European allies and the availability of pipelayers from non-U.S. sources. This transaction never materialized, however, and Caterpillar and the Soviets instead signed a contract several months later worth $40 million covering delivery of 100 pipelayers for pipelines other than the Yamal line, and Caterpillar applied for an amendment to its license.

Concern About Western Energy Dependence on the U.S.S.R.

During the first months of the Reagan Administration the U.S. Government began intensive discussion of the question of Western participation in Soviet energy development. At issue was U.S.

policy on (1) the proposed Yamal pipeline which would deliver gas from the Soviet Union to Western Europe and (2) export licensing of American oil and gas equipment and technology to the Soviet Union. Consultations with allied governments began in the spring of 1981 and continued throughout the year, while many of the arrangements for the Yamal pipeline were being negotiated. Later, in imposing sanctions directed at encouraging reconciliation in Poland the United States included measures which were expected to delay the pipeline.

The Yamal Pipeline—Although the possibility of building a follow-on line to the gas pipelines completed from the Soviet Union to Western Europe in the early 1970's had been discussed for some time, serious negotiations on the proposed Yamal line got underway only in the spring of 1980. A trilateral deal signed in 1975 was to have delivered Iranian gas to the Soviet Union and Soviet gas to Western Europe, but it had fallen through as a result of the upheaval in Iran. The Soviets needed the Yamal project to maintain purchasing power abroad. Most experts expected Soviet hard currency earnings to fall as oil exports declined because of an anticipated slowing of production. The Soviets also hoped that the prospect of progress on this project would help incline the West Europeans away from joining the United States in imposing sanctions on trade in response to the Soviet invasion of Afganistan. While the Carter Administration had warned the West Europeans about the dangers of increased energy dependence on the Soviet Union and urged them to build alternatives to Soviet gas into their planning, it had issued a validated license to Caterpillar for export of pipelayers for the project.

By March 1981 Reagan Administration officials began urging West European officials to reconsider the advisability of the Yamal pipeline (contracts had still not been signed). France and the FRG agreed to form a group to restudy the project. At the Ottawa Summit in July 1981, President Reagan raised U.S. concern about security implications of the proposed pipeline and urged his West European counterparts to pursue energy alternatives. The West Europeans, particularly FRG Chancellor Schmidt, made clear their intention to proceed with the project.

During Congressional testimony in late July, Secretary of State Alexander Haig stated that, in the final analysis, the Yamal project would be decided by the West Europeans. Secretary Haig said that Chancellor Schmidt had stated that he would base his decision on purely commercial considerations, while the United States had pointed out the potential vulnerability of the West and urged use of alternative energy sources.[31]

During the summer and fall of 1981 U.S. officials repeatedly expressed serious concerns about the proposed pipeline, warning that West European vulnerability to Soviet gas leverage could be substantial. Dependence on Soviet gas would double in most countries. Gas is hard to replace on short notice, and a cut-off, actual or threatened, would be particularly onerous for the politically sensitive European residential and commercial sectors. The United

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[31] Haig, Alexander, Secretary of State, Statement in response to questions during Hearing before Subcommittee on International Trade of the Senate Finance Committee, July 28, 1981.

States reminded Europe that in the past the Soviets had used energy exports as a political lever.[32] Attention focused increasingly during the fall on the boost the pipeline would give to Soviet hard currency earnings. These earnings would make possible Soviet high technology purchases in the West which support the modernization of the Soviet military-industrial establishment, and they would help forge an economic link with Europe that would increase Soviet influence.[33] In September and October a series of contract signings were announced covering delivery by West European firms of much of the equipment for the project.

In late fall Under Secretary of State Myer Rashish led a delegation of Government officials to Europe to discuss U.S. proposals for energy alternatives, which consisted primarily of accelerated development of Norwegian, British, Dutch, and North African gas and increased use of U.S. coal. U.S. officials also noted that softening of European demand for natural gas raised questions about the price competitiveness of Soviet gas with other forms of energy, particularly in view of the need to create storage facilities for Soviet gas as a safeguard against cutoffs due to political or technical difficulties. As on previous occasions, the West Europeans expressed interest in additional energy supplies but indicated generally that they were still inclined to move ahead with the Yamal pipeline. In late November the West German firm, Ruhrgas, signed an agreement with the Soviets (subject to FRG government approval) covering long-term purchase of gas. This contract with the largest potential purchaser of gas from the pipeline was expected to serve as a model for contracts with other potential partners.

Review of policy on Soviet energy development.—While the United States was urging its Western European allies to pursue alternatives to Yamal, the overall U.S. position on Western cooperation in Soviet energy development remained under review. Specific issues were dealt with on a case-by-case basis. At the end of July 1981 the Department of Commerce issued a validated license to Caterpillar for export of 100 pipelayers worth about $40 million with the stipulation that they not be used on the proposed Yamal pipeline (Caterpillar had requested that its November 1980 license be amended, as described above).

U.S. deliberations over whether it was in the interest of the West to assist or impede Soviet energy development continued during the fall.[34] During this period Congress's Office of Technology Assessment released a study of the role of Western technology in Soviet energy development which declared that "U.S. technology imports would have only limited effects on the U.S.S.R.'s oil and gas production" and that the United States was not the predominant supplier of most petroleum-related equipment imported by the U.S.S.R.[35] Meanwhile, U.S. licensing policy remained as before:

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[32] For example, see Hormats, Robert, Assistant Secretary of State, Testimony before Subcommittee on Energy, Nuclear Proliferation and Government Processes of Senate Committee on Government Affairs, Oct. 14, 1981.

[33] For example, see Perle, Richard, Assistant Secretary of Defense, Testimony before Senate Committee on Banking, Housing, and Urban Affairs, Nov. 12, 1981.

[34] Brady, Lawrence, Assistant Secretary of Commerce, Statement before Subcommittee on International Economic Policy and Trade of the House Committee on Foreign Affairs, Nov. 12, 1981.

[35] News Release from House Committee on Science and Technology, Dec. 9, 1981.

a presumption of approval for end-use oil and gas equipment, and a presumption of denial for applications to export industrial technology for oil and gas exploration and production equipment. Caterpillar applied for another validated export license and signed a new contract with the Soviets. In early December 1981, Senator Charles Percy's office announced that President Reagan had approved a license for export of 200 pipelayers worth about $90 million. Caterpillar did not actually receive the license, because processing had not been completed when new sanctions were imposed. (See below.)

Sanctions in response to martial law in Poland.—In December 1981 the deliberations on oil and gas policy vis-a-vis the U.S.S.R. were effectively overtaken by events as martial law was declared in Poland. The sanctions placed on trade with the U.S.S.R. on December 29 broadened the coverage of the 1978 foreign policy controls on oil and gas equipment and technology to include transmission and refining (in addition to exploration and production). Processing and issuance of validated licenses ceased for these items as well as all other items under validated license control. Among other things, this action prevented shipment to Europe of rotors produced by General Electric. These rotors were supposed to be incorporated into turbines by GE manufacturing associates who had contracted to supply G.E.-design turbines for the compressor stations which were to pump gas through the Yamal pipeline. This sanction also prohibited export to the U.S.S.R. from third countries of turbines incorporating G.E. rotors already exported from the United States.

In February 1982 Under Secretary of Commerce Lionel Olmer confirmed that the United States was considering applying the December 29 sanctions in a way that would (1) prohibit subsidiaries of U.S. firms from exporting non-U.S. oil and gas equipment and technology to the U.S.S.R. and (2) prohibit export to the U.S.S.R. of products made abroad using technology exported from the United States prior to the imposition of the U.S. controls.[36] The decision on these applications of the December 29 sanctions was left in abeyance pending assessment of the results of a mission to Europe led by Under Secretary of State James Buckley to seek agreement on limiting credits to the U.S.S.R. The work of the Buckley Mission continued up to the Versailles Summit, which in early June took up the question of credit limitation.

On June 18, after his return from the Summit, President Reagan announced that as a further step to encourage reconciliation in Poland he was expanding the December 29 sanctions covering oil and gas equipment and technology. Seven months after he had put the Soviets on notice that further steps might be necessary if repression continued, martial law remained in effect in Poland, political detainees were still held and suppression of the free trade union movement continued. The Department of Commerce issued interim regulations effective June 22 implementing the President's order. The United States expected the June 18 sanction to further delay the Yamal pipeline by as much as two years.[37]

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[36] Olmer, Lionel, Under Secretary of Commerce, Statement in response to question during Testimony before House Committee on Science and Technology, Feb. 9, 1982.

[37] Olmer, Lionel, Under Secretary of Commerce, Statement in response to question during press conference announcing the controls on oil and gas technology, June 23, 1982.

OUTLOOK

The Reagan Administration has emphasized that U.S. policy on trade with the Soviet Union will be consistent with political and security goals vis-a-vis the U.S.S.R. To a significant extent, therefore, future developments in U.S-U.S.S.R. trade will depend upon Soviet political and military conduct. The December 29, 1981 sanctions on high technology and oil and gas equipment and technology and even grain trade arrangements are linked to developments in Poland. At the same time, the United States continues the effort, begun early in the Reagan Administration, to strengthen Western strategic trade controls and limit Western credits for the U.S.S.R.

At this writing, August 1982, grain and phosphates are the only exports to the Soviet Union which show promise for significant growth under present circumstances. Primarily as the result of an increase in shipments of grain, U.S. exports are expected to grow to about $3 billion in 1982, up from $2.3 billion in 1981. The United States and the Soviet Union agreed in August to extend the long-term Grain Agreement for another year, until September 30, 1983. Several other elements of a partial framework for trade have been removed with the lapsing of the Maritime Agreement as well as cooperation agreements in science and technology and other fields, and with the cutback in Soviet commercial presence.

SOVIET-WESTERN TRADE

By William H. Cooper*

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I. INTRODUCTION

The U.S.S.R.'s commercial ties with industrialized Western (I.W.)** countries generally pre-date, the era of "détente" of the 70s. Indeed some degree of economic cooperation existed even at the height of the cold war period of the 50's and mid-60's.

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** In this Article I.W. countries include the following: Austria, Belgium, France, Italy, Japan, the Netherlands, Sweden, Switzerland, the United Kingdom, and the United States.

But, Soviet-Western trade achieved unprecedented growth rates in the 1970's primarily for the following reasons:

The relaxation of political tensions between East and West helped to generate official support for the establishment or strengthening of the institutional framework needed to ease the difficulties inherent in business relations between free-market and centrally-planned economies.

Soviet policymakers assigned a more important role to Western trade in their country's economic development.

Western firms were ready to expand their business in the Soviet market.

While Soviet-Western trade has continued to increase, the growth rate has declined recently indicating that its expansion potential is not limitless. Indeed, Soviet plans to devote more resources to trade with Eastern Europe, Soviet hard currency limitations, and disappointments with the results of some past Soviet-Western economic efforts may lead to a contraction in Soviet-I.W. trade down the road.

The purpose of this paper is to provide an overview of the Soviet-I.W. economic relationships as they exist today. The article will focus particular attention on the U.S.S.R.'s commercial ties with the Federal Republic of Germany, France, Italy, Japan, and the United Kingdom. These countries are some of the foremost economic powers in the West and are among the U.S.S.R.'s major Western trade partners—together they account for over 50 percent of Soviet trade with West.[1]

We will look at Soviet policy on trade with the West especially the political and economic factors influencing it and, likewise, we will view the basic ideas underlying the business ties of the five above-mentioned countries with the Soviet Union.

This paper will also address the structure of the Soviet trade with these nations, i.e., the commodity composition, geographical distribution and the relative importance of this trade to the nations concerned, and the trade framework.

Last, we will consider some of the prospects for Soviet-I.W. trade and the political and economic constraints that will affect them.

II. SOVIET OBJECTIVES IN TRADE WITH THE WEST

Soviet objectives in trade with the West have evolved over time based on changing economic needs and political conditions. Following World War II the USSR, along with the other members of the Soviet Bloc, economically isolated itself from the West. This isolation was caused, in part, by political tensions with the West, and by Soviet designs to create an economically independent or autarkic region, reinforced by Western-imposed restrictions on trade with the Communist World. Trade with the West was minimal and was used only for relieving shortages and bottlenecks in key sectors.

Soviet trade goals changed in the late 1960's as Soviet planners realized that economic growth could be enhanced through expanded participation in the world economy and less emphasis placed on self-sufficiency. Political tensions, particularly with Western Europe, began to ease, opening the way for greater East-West economic cooperation.

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[1] Soviet trade data.

As the USSR entered the seventies, its leaders strengthened the commitment to foreign trade, particularly with the West. At the 24th Congress of the Communist Party of the Soviet Union in 1971, Soviet Party leader Brezhnev referred to foreign trade as a "big reserve" for Soviet economic development.[2] He underscored the importance of foreign commerce more strongly at the 25th Congress in 1976:

"Like other states we strive to use the advantage provided by foreign economic ties to mobilize extra possibilities for the successful solution of economic tasks and to gain time to increase the efficiency of production and speed up the progress of science and technology."[3]

Soviet objectives in trading with the West since the beginning of the 70's have been:

(1) to continue to alleviate shortages and bottlenecks in key economic sectors. Fluctuations in domestic production caused by, inter alia, bad weather forced the USSR in the 70's to import grains from the West, especially from the United States. The Soviets also imported Western steel to make up for domestic shortages.

(2) to improve factor productivity in certain industries and develop new ones. Imports of Western capital equipment and technology aided the growth of the USSR's automotive, chemical, and machine building industries.

(3) to reinforce the Soviet Union's political relationship with Western nations. In 1976 Brezhnev stated: ". . . economic and scientific-technical ties with the capitalist states strengthen and broaden the material basis of the policy of peaceful coexistence."[4] With the deterioration in their political and commercial relations with the United States at the end of the 1970's and into the 1980's, the Soviets have used economics to support their policy of trying to drive a wedge between the United States and its allies.

Soviet Premier Nikolai Tikhnov enunciated current Soviet foreign trade policy at the 26th Soviet Communist Party Congress in February 1981. He stated that foreign economic relations must to a greater degree than before help meet the needs of the Soviet economy for equipment, technology, raw materials and the demand for consumer goods. The Soviet Premier specifically reaffirmed the U.S.S.R.'s commitment to commercial ties with the industrialized West.[5]

III. WESTERN ATTITUDES

The view of Western governments as to the role of commercial ties in their overall relationship with the Soviet Union differ from state-to-state. Some look on trade as subordinate to political objectives. The United States is an example of one Western state which has frequently used economic actions to send political signals. (U.S.-U.S.S.R. commercial relations are covered elsewhere in this volume.) Other Western countries, such as the FRG, France, Italy, Japan and Great Britain, have been less inclined to mix politics and economics in recent years. Their tendency is to view separately the two facets of their relations with the Soviet Union. Some examples will illustrate this point.

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[2] Materiali XXIV S"ezda KPSS (Moscow, Politicheskaya Literatura, 1974), p. 61.

[3] XXV S"ezda Kommunisticheskoi partii Sovetskovo Soyuza Stenografichesky Otchet, Izdatel' stvo Politicheskoi Literatury, Moscow, 1976, p. 80.

[4] Ibid, p. 80.

[5] Foreign Broadcast Information Service, Daily Report, Soviet Union, Proceedings of the 26th CPSU Congress, Volume V, March 2, 1981, p. 26.

The current West German approach to trade with the Soviet Union is part of the overall Eastern policy—Ostpolitik—the FRG has followed since the beginning of the 1970's. West Germany, led by Willy Brandt, and later Helmut Schmidt, has sought to ease tensions with the U.S.S.R. and Eastern Europe and has used stronger trade relations to work towards that objective and to provide new markets for West German industry.[6]

Previous FRG leaders, most notably Chancellor Konrad Adenauer, closely tied economics with politics. Adenauer considered political issues, e.g. the status of West Berlin, repatriation of ethnic Germans, paramount in the FRG-Soviet relationship and granted commercial considerations only after the Soviets made certain major political concessions. For example, Bonn signed its first trade agreement with Moscow (a pact long sought by the Soviets) in 1958 only after the Soviets permitted West Berlin to be included, albeit tacitly, as part of the FRG for the purpose of the agreement. In addition, the Soviets had to agree to allow the repatriation of certain categories of Germans living in the U.S.S.R. These and other political issues remained sore points in Soviet-West German relations and when tensions increased, economic relations were affected.[7]

The United States played a key role in the FRG's East-West trade policy during the Federal Republic's early years. The 1962-63 pipe embargo is a case in point. The United States, through NATO, ordered the suspension of pipe sales to the U.S.S.R. in an effort to curb Western involvement in the development of the construction of the "Friendship Pipeline." This pipeline was designed to connect Soviet oil fields in the Urals-Volga region with Czechoslovakia, East Germany, and Poland. The U.S. claimed fuel from the line would be used to supply Soviet troops in the GDR. Adenauer and the FRG acceded to American wishes.[8]

Since the beginning of the 70's, the FRG has avoided the use of economics as negative leverage in trying to obtain political concessions from the U.S.S.R.

The French attitude toward trade with the Soviet Union has also been one of seeking to use it as a stablizing factor in the overall relationship while garnering business for French firms. This policy has been part of the "special relationship" France, beginning with de Gaulle, pursued with the Soviets since the mid-1960's.

Japan's political relations with U.S.S.R. have not been particularly amicable. The two nations have not reached a post-World War II peace treaty and Soviet military occupation of the Northern Islands, along with Japanese ties with the PRC, have kept Japanese Soviet relations in a state of tension. Yet, Japan has pursued economic relations with Moscow, most notably in the form of a group of development projects in Siberia. The Japanese Government has extended financial support for these endeavors since 1968.[9]

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[6] Angela Stent, "From Embargo to Ostpolitik: The Political Economy of West German-Soviet Relations 1955-1980," Cambridge, Cambridge University Press, 1982, p. 215.

[7] Stent, pp. 63-65, 84.

[8] Stent, p. 82.

The importance Western Europe and Japan have assigned to Soviet trade is shown by the reactions of their governments to political crises caused by the Soviet invasion of Afghanistan and by the imposition of martial law in Poland.

President Carter imposed a series of sanctions, largely economic controls, against the U.S.S.R. in response to that country's December 1979 invasion of Afghanistan. The FRG, France, Italy, Japan and the United Kingdom all condemned the Soviet move. The five countries plus Canada and the United States issued a joint communique at the 1980 Economic Summit in Venice which stated "we . . . reaffirm that the Soviet military occupation of Afghanistan is unacceptable now and that we are determined not to accept it in the future." The seven countries went on to call for the withdrawal of Soviet troops from Afghanistan.[10]

All agreed not to undermine U.S. sanctions. Some took their own actions but these steps clearly did not include disruption of their commercial ties with the U.S.S.R. West Germany, for example, followed the U.S. lead of persuading its athletes not to participate in the 1980 Moscow Olympics.

The West German government also indicated it would not permit German firms to accept business lost by American firms because of the controls. However, Chancellor Schmidt stated that West Germany would continue normal trade relations with the Soviets as it considered trade with the U.S.S.R. an important element of stability in Europe. For example, the ninth session of the Joint Soviet-West German Commission for Economic, Scientific, and Technical Cooperation was held in May 1980. The West Germans also commenced negotiations with the Soviets on the Yamal pipeline.[11]

The French also maintained normal business ties with the Soviets. In February 1980 they signed an 5-year accord which guaranteed the Soviets export credits at subsidized rates.[12]

Their desire for the economic benefits of trade with the U.S.S.R. was underscored by the Novolipetsk project issue. In September 1980 the French firm Creusot-Loire (C–L) announced the signing of a contract to build a steel complex in Novolipetsk, U.S.S.R. C–L had been a competitor for this project, which the Soviets eventually awarded to the U.S. firm Armco and the Japanese company Nippon Steel. Their participation as terminated after President Carter's imposition of the sanctions. The U.S. Government protested to the French Government claiming the signing of the contract violated the pledge that French firms would not substitute transactions given up by American firms as a result of U.S. sanctions against the Soviet Union. The French Foreign Ministry, on the other hand, claimed that Creusot-Loire would not be replacing equipment and knowhow that would have been supplied by Armco and thus would not be violating the pledge.[13]

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[9] Hiroshi Kimura, "Japan-Soviet Relations Framework, Development, Prospects," Asian Survey, vol. XX, no. 7, July 1980, pp. 709–722.

[10] New York Times, June 23, 1980.

[11] Stent, p. 238.

[12] "Business Eastern Europe", March 21, 1980, p. 90.

The United Kingdom imposed a list of sanctions on the Soviet Union in response to the Afghanistan invasion. Among these controls were a decision not to renew the 1975 Anglo-Soviet credit agreement that allowed the Soviets credits below OECD consensus terms. But, subsidized credits could still be extended on a case-by-case basis. The U.K. Government also pledged to apply COCOM standards for technnology transfer more strictly.

In announcing the sanctions then British Foreign Secretary Lord Carrington stated: "It is right that the Soviet Union should feel the strength of our disapproval. That should help them to avoid miscalculation in the future. But it is also right that we should, were possible, continue to search for arms control agreements, commercially justified trade, and other arrangements of mutual benefit." [14]

Japan pledged not to engage in new joint projects with the Soviet Union and not to extend credits for new projects. Japanese business also lost with the collapse of the steel complex project at Novolipetsk.

On December 3, 1981, the Polish Government established a martial law regime in Poland. On December 29 President Reagan imposed a series of economic sanctions on the U.S.S.R. in response to Soviet responsibility for the situation in Poland. Most notably, the United States suspended the issuance of validated licenses for exports to the U.S.S.R. and expanded the list of oil and gas equipment requiring validated export licenses. (See article elsewhere in this volume on U.S.-Soviet commercial relations for a more detailed discussion of U.S. sanctions).

America's West European allies took somewhat stronger measures against the Soviet Union in the Polish case than they did after Afghanistan. But their actions were less strong than the U.S. sanctions and showed West European reluctance to jeopardize trade relations with the U.S.S.R. The major element of these sanctions was in the form of joint measures taken by Common Market members (including FRG, France, Italy, and the U.K.)

On March 15, 1982 the EC approved a cutback in imports of Soviet manufactured and luxury goods. These restrictions involved around 60 items, e.g., caviar, diamonds, machine tools, certain wood products, and were in the form of lowering already existing quotas by 50 percent and by imposing quotas on some previously uncontrolled items equal to 25 percent of the 1980 trade levels.

Some individual members took unilateral economic actions. The FRG government sought to limit official promotion of cooperation between West German firms and Soviet business organizations. It cancelled the January 1982 meeting of the FRG–USSR Mixed Commission. Outside the EC, Japan pledged to extend the policy of curbing new official credits to the Soviet Union which was instituted after the invasion of Afghanistan and postponed annual consultations on Japanese-Soviet trade.

Despite their actions these countries maintained the framework of their trade relations with the U.S.S.R. No country took action to undermine existing major projects with the U.S.S.R. France, FRG, and Italy have proceeded with the Yamal pipeline project with the Soviet Union. Japan is still working with the Soviets on the Sakhalin project. (Both projects are described later in this paper.)

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[13] New York Times, September 11, 1980.

[14] New York Times, January 25, 1980.

IV. THE STRUCTURE OF SOVIET-I.W. TRADE

A. GENERAL TRENDS

Western trade, in varying degrees, has always played a role in Soviet economic development. Even during the height of the cold war period that followed World War II, goods flowed between the U.S.S.R. and the West. But these commercial ties increased rapidly in the 1970's. During this decade Soviet policymakers accelerated their country's Western trade to obtain technology and equipment to modernize more quickly their production capabilities, to reduce the technology gap with the West and, in general, to improve the Soviet industrial base. At the same time Western businesses looked to the Soviet Union as a rapidly expanding new market for their wares.

An analysis of the trade data underscores the increasing importance of Western trade to the Soviet Union. In 1965 the industrialized West accounted for only 19 percent of the U.S.S.R.'s world trade. By contrast the Soviets conducted the major portion, or 57 percent, with their East European allies. In 1970 the I.W. nations share of Soviet trade began to increase as new policies began to take hold, but this portion remained small—21 percent—while the East European share was 55 percent. Later in the 1970's this trend became more predominant. In 1975, for example, Western trade's share of total Soviet world commerce increased to 31 percent and in 1980 to 34 percent. On the other hand Soviet economic relations with the East had dropped in importance—to about 43 percent of Soviet world trade in 1980. (See Table I)

TABLE I.—GEOGRAPHICAL DISTRIBUTION OF SOVIET FOREIGN TRADE

[As percentages of world trade]

	1965	1970	1975	1980	1981
Soviet trade with:					
Eastern Europe:					
Exports	56	53	47	42	43
Imports	58	57	41	43	40
Industrialized West:					
Exports	18	19	26	32	30
Imports	20	24	36	35	34
Developing countries:					
Exports	15	16	14	14	15
Imports	11	11	11	11	15

Source: Soviet trade data.

Soviet foreign trade policy has always been import-led, i.e., the primary objective is to fill the economy's needs through imports while exports are used to pay for those imports; therefore, we should consider how Soviet reliance on Western imports has changed. The Soviets relied more heavily on Western imports during the 1970's and 1980's. In 1970 24 percent of Soviet imports came from the West while 57 percent were from Eastern Europe. By 1980 the share of Soviet imports of Western origin had increased to 35 percent while the portion from the East had dropped to 40 percent.

In 1981, Soviet trade patterns shifted once again although at this point it is too early to ascertain a clear trend. In that year the I.W. portion of the Soviet trade dropped from 34 to 32 percent, but so did that of Eastern Europe—to 41 percent (from 43 percent). In 1981 Soviets began to reach out to the LDC markets for their import needs, e.g., grain.

Soviet trade with the West has grown without interruption, but its growth rate has dropped recently. The five-year (1976-80) total of 114.5 billion rubles was almost 2.5 times larger than the volume of Soviet trade with I.W. during the previous five-year period. However, the average annual growth rate for Soviet trade with I.W. countries dropped from about 28% during the 1971–75 period to roughly 16% in the 1976–80 time span. From 1980–1981 this trade grew by only 12%. The reduction was caused by, among other things, decreased Soviet hard currency earnings, Soviet problems in absorbing Western plant and equipment, and the downturn in overall Soviet relations with the West.

With the exception of two years—1974 and 1980—the Soviet Union has realized a negative balance of trade with the West from 1970–1981. In the early 70's this deficit was relatively small—less than a billion rubles. The deficit grew significantly in the mid-70's as Soviet purchases of Western equipment, technology, and agricultural products increased rapidly. Higher prices for Soviet oil exports have helped the U.S.S.R. to narrow the trade gap in recent years and even earn a slight surplus in 1980.

Raw materials, particularly energy and metals have comprised the major portion of Soviet exports to the West and will continue to do so for the foreseeable future. Oil is the primary Soviet hard currency earner (accounting for 51 percent hard currency exports in 1980) but is expected by the Soviets to be replaced by natural gas later in the 1980's. Western exports to the Soviet Union have consisted of mostly machinery and equipment (23 percent) especially in the chemical, metalworking, and energy sectors, and agricultural products (34 percent). (Table II)

Trade with I.W. countries has accounted in general for a small portion of Soviet economic activity. In 1980 Soviet exports made up 1.8 percent of Soviet GNP. The ratio of Soviet imports from the West to GNP stood at 1.7 percent. In the same year total Soviet exports accounted for 5.5 percent GNP and the ratio of total imports to GNP was 5.0 percent.

TABLE II.—SOVIET HARD CURRENCY TRADE

[Dollar amounts in million of U.S. dollars]

	Exports, f.o.b.						Imports, f.o.b.					
	1970		1975		1980		1970		1975		1980	
	Amount	Percent of total	Amount	Percent of total	Amount	Percent of total	Amount	Percent of total	Amount	Percent of total	Amount	Percent of total
Total	$2,201	100	$7,835	100	$23,498	100	$2,708	100	$14,257	100	$26,017	100
Of which:												
Fuels	493	22	3,887	48	15,095	64	8	([1])	497	3	[2]700	3
Crude oil and petroleum products	387	18	3,276	41	12,028	51	8	([1])	497	3	[2]700	3
Natural gas	13	1	220	3	2,706	12	0	0	0	0	0	0
Coal and coke	93	4	391	5	362	2	0	0	0	0	0	0
Machinery and equipment	140	6	560	7	1,388	6	927	34	4,593	32	6,039	23
Ferrous metals	129	6	167	2	246	1	279	10	2,567	18	3,469	13
Chemicals	67	3	256	3	765	3	208	8	742	5	1,565	6
Wood and wood products	365	17	712	9	1,476	6	84	3	214	2	203	1
Agricultural products	205	9	572	7	478	2	615	23	3,856	27	8,800	34
Grain	22	1	3	([1])	0	0	101	4	2,323	16	4,400	17
Other	183	8	569	7	478	2	514	19	1,533	11	4,400	17
Consumer goods	76	3	215	3	152	1	260	10	436	3	745	3

[1] Negligible.

[2] Estimated.

Source: Soviet foreign trade data.

The five countries selected for this study—FRG, France, Italy, Japan, and the United Kinddom, have been among the U.S.S.R.'s leading Western trade partners. Their role in the Soviet trade has varied over the years.

B. FRG-SOVIET TRADE

In 1970 the Federal Republic of Germany ranked third among the U.S.S.R.'s Western trade partners but in recent years has risen to first place where it remains. However, West Germany dropped to second place behind Finland in 1981 as a Soviet supplier. In 1981 FRG-Soviet trade reached 6 billion rubles or 17 percent of the U.S.S.R.'s trade with the West; the FRG was responsible for about 15 percent of Moscow's Western imports and 21 percent of its Western exports. The FRG accounted for 5 percent of Soviet world imports and 6 percent Soviet world exports in 1981. (Table III)

TABLE III.—SOVIET RELIANCE ON FRG TRADE

[In percent]

	1965	1970	1975	1980	1981
Soviet world trade:					
Exports	1.8	2.0	3.8	6.2	6.3
Import	1.7	3.2	7.3	6.7	5.1
Soviet-I.W. trade:					
Exports	9.8	10.7	15.1	18.8	21.1
Imports	8.3	13.3	20.0	19.0	14.9

Source: Soviet trade data.

Soviet-West German trade has generally grown over the years, but recently this rate of growth has declined significantly. The average annual growth rate was 40 percent during the 1971-75 period but dropped to 16 percent in the 1976-80 time span. From 1980 to 1981 the trade turnover grew by only 4 percent; in fact, West German exports declined 23 percent according to official West German trade statistics. The West Germans have realized a surplus in their Soviet commercial relations over time, but soaring fuel prices and decreased Soviet demand for West German goods led to a Soviet surplus in 1981.

Soviet exports to the FRG are heavily weighted toward the energy sector; in fact, in 1981, fuels comprised 77 percent Soviet sales to the West Germans. The FRG has been a significant purchaser of Soviet energy exports. One fifth of total Soviet natural gas exports went to West Germany in 1980; roughly 9 percent of the U.S.S.R.'s crude oil and petroleum product exports went there as well.[15]

The U.S.S.R. for a number of years has looked to West Germany for steel supplies particularly in the form of pipe for transmitting oil and natural gas. In 1980 the Soviets bought 30 percent of their imported pipe from the West Germans. Thus, while the FRG accounts for a small portion of overall Soviet world trade, the West Germans do play an important role both in Soviet exports and imports in certain sectors. Machinery, especially that for the metalworking sector is another important FRG export to the U.S.S.R. In 1981 machinery accounted for 34 percent of FRG exports to the Soviet Union. (Table IV).

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[15] Soviet trade data.

TABLE IV.—WEST GERMANY: TRADE WITH THE U.S.S.R., 1981

Commodity	Million	Percentage of— Total to U.S.S.R.	Percentage of— Worldwide
WEST GERMAN EXPORTS			
Total	$3,330	100.0	1.9
Agriculture	419	12.6	4.1
Raw materials	44	1.3	.9
Fuels	6	.2	.1
Manufactures	2,861	85.9	1.9
Chemicals	431	12.9	2.0
Semi-finished goods	1,165	35.0	3.6
Iron and steel	890	26.7	8.9
Machinery	1,142	34.3	2.4
Metal-working	281	8.4	8.1
Transport	60	1.9	.2
Consumer goods	63	1.9	.4
Other	0	0	0
WEST GERMAN IMPORTS			
Total	4,040	100.0	2.5
Agriculture	34	1.0	.2
Raw materials	381	9.4	2.8
Fuels	3,112	77.0	7.8
Crude oil	271	6.7	1.2
Oil products	1,037	25.7	10.3
Natural gas	1,624	40.2	25.8
Manufactures	349	8.6	.4
Other	164	4.1	3.3

Source: West German trade data.

West German "dependence" on the Soviet economy is likewise highly selective. Exports to the U.S.S.R. accounted for about 2 percent of total West German foreign sales and amounted to about 0.5 percent of that country's GNP in 1980. (Total FRG exports accounted for 23 percent of GNP.) Approximately 100,000 to 150,000 workers (out of a total labor force of about 25 million persons) in the Federal Republic are employed in producing goods for the Soviet market.[16]

On the whole the U.S.S.R. has been a small market for West German manufacturers but does play an important role in FRG's steel and machine tool sales. The West German machine tool and steel industries are heavily dependent on exports to maintain their viability. The U.S.S.R. alone purchases 9–11 percent of total export sales in both industries.[17]

The importance of Soviet products to the West German economy is centered in energy. About 7 percent of Bonn's energy imports covering roughly 4 percent of primary energy needs come from the U.S.S.R. Bonn has been buying Soviet natural gas since 1973 under gas-for-pipe arrangements. This fuel now makes up 17 percent of total FRG gas consumption. The Soviet-West European pipeline, in which the Germans will be major participants, is expected to increase the importance of Soviet gas in the West German energy picture.[18] Oil has been another major German import (5 percent of total West Germany oil consumption) from the Soviet Union although its importance has been decreasing. In 1980 Bonn received 12.3 percent of its crude oil and oil products imports from the U.S.S.R. and 11.5 percent in 1981. (Table IV)

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[16] U.S. Government estimates.

[17] U.S. Government estimates.

Although the West Germans are totally dependent on the outside for sources of strategic metals, the U.S.S.R. supplies only a very small share—roughly 2 percent—on an overall basis. The most important of these are palladium of which Moscow supplies 50 percent. The Soviets account for 24 percent FRG titanium and 14 percent its platinum supplies.[19]

In sum, although the FRG is an important partner in Soviet-Western trade, the importance each country plays in the others economy is concentrated in specific sectors. In addition, the rate of growth of this trade has dropped recently.

C. FRENCH-SOVIET TRADE

Next to West Germany, France is probably the most important I.W. trade partner of the Soviet Union. France's role in Soviet trade has grown in recent years. In 1975, for example, it was sixth among the U.S.S.R.'s Western trade partners. In 1980 and 1981, France moved-up to third place behind West Germany and Finland. In 1981 France's share of Soviet-I.W. trade amounted to 12 percent and 3.2 percent of Soviet world trade. (Table V)

TABLE V.—SOVIET RELIANCE ON FRENCH TRADE

[In percent]

	1965	1970	1975	1980	1981
Soviet world trade:					
Exports	1.3	1.1	2.1	4.5	4.4
Imports	1.4	2.7	3.0	3.4	3.2
Soviet-I.W. trade:					
Exports	7.4	5.8	8.0	9.5	9.7
Imports	6.9	11.3	8.3	9.6	9.2

Source: Soviet trade data.

The growth in Soviet-French trade was fairly constant in the 1970's. The average annual rate of growth between 1971 and 1975 was 26 percent and between 1976 and 1980—25 percent. This trade grew 12 percent in 1981.

Except for a small negative balance in 1971, the French realized surpluses in their annual trade with the Soviet Union from 1970 to 1979. In 1980 it incurred a $1.1 billion deficit due to rising Soviet energy prices. The negative balance continued into 1981. (Table VI)

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[18] U.S. Government estimates.

[19] U.S. Government estimates.

TABLE VI.—FRANCE: TRADE WITH THE U.S.S.R., 1980 [1]

Commodity	Million	Percentage of— Total to U.S.S.R.	Percentage of— Worldwide
FRENCH EXPORTS			
Total	$2,464	100.0	2.2
Food and agriculture	622	25.2	3.4
Energy	16	.6	.3
Chemicals	559	22.7	4.9
Metals	379	15.4	2.5
Iron and steel	359	14.7	3.6
Machinery and transport equipment	681	27.6	1.7
Manufactures	150	6.1	1.1
Minerals	19	.8	.7
Wood and paper	38	1.6	1.1
FRENCH IMPORTS			
Total	3,556	100.0	2.6
Food and agriculture	42	1.2	.3
Energy	2,722	76.5	7.6
Coal	85	2.4	4.7
Crude oil	1,585	44.6	6.1
Oil products	578	16.3	13.8
Gas	467	13.1	18.3
Chemicals	385	10.8	3.7
Metals	68	1.9	.5
Iron and steel	1	([2])	([2])
Machinery and transport equipment	59	1.7	.2
Manufactures	133	3.7	.9
Minerals	11	.3	.3
Wood and paper	134	3.8	2.2

[1] Latest data available.

[2] Negligible.

Source: French trade data.

Soviet fuels comprise the major portion of the U.S.S.R.'s exports to France—83 percent in 1981. Oil and oil products are the most important commodities within this group. France is not a dominant purchaser of any particular group of Soviet products. In 1980 the French bought 8 percent of the U.S.S.R.'s natural gas exports and approximately 9 percent of that country's oil and oil products sold in foreign markets. The French also buy Soviet chemicals, wood and paper.[20]

Soviet purchases from France have been dominated by machinery and equipment, particularly equipment for the Soviet Union's developing chemical industry. In fact, French firms are key suppliers of chemical-industry-related equipment for the Soviet Union accounting for 18 percent of such Soviet imports. West Germany and Great Britain have also been major suppliers.[21]

Steel pipe is another important Soviet import from France although Moscow's dependence on the French products has not been great. In 1980, for example, the U.S.S.R. purchased 9 percent of its imported pipe from France. But French pipe sales together with those of the FRG, Japan and Italy comprised close to 80 percent of

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[20] Soviet trade data.

[21] Soviet trade data.

Soviet pipe imports in 1980. Food and agricultural products and chemicals are also major French exports to the U.S.S.R.[22]

French dependence on Soviet trade is not very significant. French sales to the U.S.S.R. have hovered around 0.4 percent of French GNP (while total French exports have accounted for 18 percent GNP) and about 2 percent total French foreign sales. Soviet exports have accounted for about 2 to 3 percent of French imports. Energy, the most significant product, has comprised only a small portion of total French energy imports, about 8 percent. This portion would increase if gas from the Yamal pipeline begins to flow in the mid-1980's. (Table VI)

To summarize, French-Soviet trade has grown fairly steadily since 1970, and France has become an important Western trade partner of the Soviet Union. French significance as a supplier is centered around a key sector—machinery and equipment. Soviet energy imports make up only a small portion of total French fuel supplies, but this portion is expected to grow in the latter half of the 1980's.

D. ITALIAN-SOVIET TRADE

Close economic ties between the U.S.S.R. and Italy predate the upsurge in East-West trade in the 70's. Large Italian firms such as Fiat and ENI were in the forefront of expanding East-West trade. But the role the Italians play in Soviet-Western trade decreased somewhat with detente which permitted increased Soviet access to high technology from the United States, France, Japan and West Germany. The relative attractiveness of less sophisticated Italian goods to the Soviet decreased. Italy's declining role is under-scored by the data. In 1975 Italy accounted for 11 percent of Soviet trade with the industrialized West. This portion dropped to slightly less than 10 percent by 1981. Italy supplied around 7 percent Soviet imports in 1975, 5.5. percent in 1981. (Table VII)

TABLE VII.—SOVIET RELIANCE ON ITALIAN TRADE

[In percent]

	1965	1970	1975	1980	1981
Soviet-world trade:					
Exports	1.8	1.7	2.7	4.2	4.4
Imports	1.3	2.7	3.0	2.1	1.9
Soviet-I.W. trade:					
Exports	9.9	8.9	10.4	13.2	14.2
Imports	6.3	11.1	8.1	6.0	5.5

Source: Soviet trade data.

Fuels have been the primary Soviet export to Italy, (85 percent Soviet exports to Italy in 1981) which was the second largest Soviet customer for natural gas in terms of value in 1980. Italy has also been a key supplier of steel pipe, having provided 12 percent of Soviet pipe imports in 1980.[23]

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[22] Soviet trade data.

[23] Soviet trade data.

During the 60's to mid-70's the Soviet contribution to Italian world business rose from 1.9 percent in 1965 to 2.6 percent in 1980 where it has remained. Soviet purchases have accounted for roughly 1.5 percent of Italy's foreign sales and 0.3 percent Italian GNP. Approximately 100,000 Italian workers (out of total labor force of about 20 million persons) are employed in producing merchandise for the Soviet market.[24] Soviet sales, while not significant to the Italian economy as a whole, still remain important to those companies such as Montedison, Fiat, and ENI, with long East-West trade experience.

The U.S.S.R. provides around 8 percent of Italy's energy imports—5.7 percent of its imported crude oil and 44 percent imported natural gas. Soviet shipments of crude oil to Italy have declined over the years, more than to the other West European countries. Italy has imported natural gas from the Soviet Union since 1974 under a 25-year agreement.[25] As of the time of this writing, Italy was continuing its "pause for reflection," and had not decided whether to purchase gas from the Yamal pipeline.

Soviet-Italian trade patterns have been inconsistent during the last decade. During the first half of the 70's, the growth rates ranged from a low of 6 percent (1971) to a high of 85 percent (1975) averaging out to 31 percent for the five-year period. In the second half, the range was from 5 percent in 1978 to 41 percent in 1980, with a five year average of 17 percent. From 1980 to 1981 trade between the U.S.S.R. and Italy increased by 15 percent. The balance of trade had generally been in Italy's favor, but in the last two years Soviet exports have outbalanced imports from Italy by 2 to 1 in terms of value. In 1981 Italy had incurred at $1.8 billion deficit in its Soviet trade. (Table VIII)

TABLE VIII.—ITALY: TRADE WITH THE U.S.S.R., 1981

Commodity	Million	Percentage of—	
		Total to U.S.S.R.	Worldwide
ITALIAN EXPORTS			
Total	$1,289	100.0	1.7
Agriculture	111	8.6	2.0
Fuels	15	1.2	.2
Raw materials	91	7.1	2.2
Manufactures	1,072	83.2	1.8
Chemicals	102	7.9	2.0
Semifinished products	470	36.5	3.1
Machinery	409	31.7	1.8
Transport equipment	46	3.6	.5
Consumer goods	45	3.5	.7
ITALIAN IMPORTS			
Total	3,105	100.0	3.4
Agriculture	14	.5	.1
Fuels	2,647	85.2	8.5
Crude oil	1,285	41.4	5.8
Refined products	289	9.3	5.7
Natural gas	1,056	34.0	44.4
Coal	17	.5	1.2

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[24] U.S. Government estimates.

[25] U.S. Government estimates.

TABLE VIII.—ITALY: TRADE WITH THE U.S.S.R., 1981—Continued

Commodity	Million	Percentage of—	
		Total to U.S.S.R.	Worldwide
Raw materials	246	7.9	2.7
Manufactures	198	6.4	.4

Source: Italian Trade data.

E. U.K.-SOVIET TRADE

Of the 5 countries presented here for study, the United Kingdom has become the least important Western trade partner of the Soviet Union—7th in recent years having dropped from second place in 1970. In the 1950's U.K. trade with the Soviets kept pace with that of other West European countries. In 1971 the Soviet Union's trade with Great Britain was 2.5 percent Soviet world trade. By 1981 this figure had fallen to 1.4 percent. (Table IX)

TABLE IX.—SOVIET RELIANCE ON U.K. TRADE

[In percent]

	1965	1970	1975	1980	1981
Soviet-world trade:					
Exports	3.6	3.6	2.5	1.7	1.1
Imports	1.9	2.1	1.4	2.1	1.6
Soviet-I.W. trade:					
Exports	19.7	19.4	9.6	5.4	3.7
Imports	9.3	8.8	3.8	6.1	4.7

Source: Soviet trade data.

A combination of economic and political factors have contributed to this diminishing role. Soviet demand shifted from chemicals and consumer items, which made up most of the British exports to the Soviet Union, to heavy machinery and equipment sold by other Western suppliers. Political tensions between the two nations, particularly in the last several years, have affected the atmosphere for commercial ties.

Sales to the Soviet Union have made an insignificant contribution to the British economy. These exports have made up roughly 1 percent of total British foreign sales and 0.2 percent of GNP. (Total British exports made up 23 percent of GNP.) Probably less than 100,000 primary and 25,000 secondary British jobs (out of total labor force of roughly 26 million persons) are dependent on exports to the U.S.S.R. U.K.-produced machinery, metals, chemicals and textiles make up the bulk (85 percent) of British exports to the U.S.S.R. The U.K. is one of the Soviet Union's main foreign suppliers of equipment in the chemical industry having provided about 13 percent of Soviet imports in 1980.[26]

The British economy is not dependent on Soviet products. In 1980, for example, about 1.5 percent of total U.K. imports came from the Soviet Union. (Table X) These imports have consisted mostly of industrial diamonds, crude oil and petroleum products and wood products. British demand for Soviet crude oil and oil products has declined over the years because of higher prices and the development of North Sea resources. The Soviet Union supplied somewhat less than 3 percent of U.K. imported energy in 1980. Only about 1 percent of British supplies of strategic metals are of Soviet origin.[27]

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[26] U.S. Government estimates.

TABLE X.—UNITED KINGDOM: TRADE WITH THE U.S.S.R., 1980[1]

Commodity	Million	Percentage of—	
		Total to U.S.S.R.	Worldwide
U.K. EXPORTS			
Total	$1,059	100.0	0.9
Food and agriculture	37	3.5	.5
Energy	3	.3	(2)
Chemicals	202	19.1	1.6
Manufactures	348	32.8	1.5
Machinery and transport equipment	354	33.4	.9
U.K. IMPORTS			
Total	1,829	100.0	1.5
Food and agriculture	13	.7	.1
Energy	423	23.1	2.6
Chemicals	74	4.0	1.0
Manufactures	911	49.8	3.3
Machinery and transport equipment	51	2.8	.2
Cork and wood	246	13.5	15.5

[1] Latest data available.
[2] Negligible.
Source: British trade data.

F. JAPANESE-SOVIET TRADE

Soviet-Japanese trade has increased over the years, but Japan's portion of Soviet-I.W. trade has declined. In 1970, for example, the Soviet Union conducted 14 percent of its Western trade with Japan. By 1981 the share had dropped to 9 percent with most of the decline resulting from decreasing Soviet imports. (Table XI)

TABLE XI.—SOVIET RELIANCE ON JAPANESE TRADE

[In percent]

	1965	1970	1975	1980	1981
Soviet-world trade:					
Exports	2.3	3.0	2.8	1.9	1.4
Imports	2.2	2.9	4.7	4.0	4.2
Soviet-I.W. trade:					
Exports	12.4	15.8	10.9	6.0	4.7
imports	10.9	12.2	12.9	11.3	12.2

Source: Soviet trade data.

Producer's goods make up the majority of Japanese sales to the Soviet Union. Japan is a key supplier to Moscow of rolled steel and pipe. Oil well drilling pipe and tubing, large-diameter welded pipe for pipeline, seamless pipes and tubes, and specialty steels are among the major Japanese products shipped to the Soviet Union. Japan's machinery exports to the Soviet Union are almost all capital goods destined for resource development projects or for upgrading Soviet manufacturing facilities. Wood products are the primary Soviet exports to Japan—around 40 percent of the total. Japan is a prime purchaser of Soviet wood product exports—74 percent in 1980.[28]

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[27] U.S. Government estimates.

Trade with the U.S.S.R. is relatively unimportant to the Japanese economy. In 1965 the Soviet Union accounted for 2.5 percent of Japanese world trade. By 1980 this figure had dropped to 1.7 percent. (Table XII) Sales to the Soviet Union except for a few commodities, are marginally important to Japan. Around 1.5 percent total Japanese foreign sales are to the U.S.S.R. constituting about 0.3 percent of Japanese GNP. (In 1980 total Japanese exports made up 12 percent of Japanese GNP.)

TABLE XII.—JAPAN: TRADE WITH THE U.S.S.R., 1981

Commodity	Million	Percentage of—	
		Total to U.S.S.R.	Worldwide
JAPANESE EXPORTS			
Total	$3,251	100.0	2.1
Food	5	.1	.2
Mineral fuels	41	1.3	7.6
Raw material	10	.3	1.6
Semimanufactures	402	12.4	3.3
Manufactures	2,708	83.3	2.0
Chemicals	122	3.7	2.1
Textiles	112	3.5	6.9
Iron and steel	1,351	41.5	6.9
Transport equipment	351	10.8	.8
Machinery	648	19.9	1.5
Precision instruments	44	1.3	.5
Other	85	2.6	6.8
JAPANESE IMPORTS			
Total	1,756	100.0	1.4
Food	91	5.2	.5
Mineral fuels	274	15.6	.4
Crude oil and petroleum products	180	4.0	1.4
Coal	79	10.0	1.6
Raw materials	170	9.7	2.0
Semimanufactures	524	29.9	4.4
Manufactures	697	39.7	3.0
Chemicals	39	2.2	.8
Iron and steel	15	.8	1.2
Ships	35	2.0	4.8
Machinery	3	.2	.1

Source: Japanese trade data.

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[28] Soviet data.

TABLE XIII.—IMPORTANCE OF TRADE WITH WORLD AND U.S.S.R. TO SELECT COUNTRIES, 1980

[Percentage of GNP]

Country	Exports to—	
	U.S.S.R.	World
France	0.2	22.6
Italy	.4	17.6
Japan	.3	11.4
West Germany	.5	23.2
United Kingdom	.2	22.6

Source: U.S. government estimates.

Even in the steel sector, a primary Soviet import, sales to the Soviet Union have constituted only 6 percent of total iron and steel exports. However, the U.S.S.R. has been the principal buyer of Japanese-produced large-diameter welded pipe—roughly 50 percent of total output.[29]

In 1980 the share of Japanese imports coming from the U.S.S.R. was only 1.3 percent. Only in Soviet strategic metals is Japanese dependence great. Tokyo received 39 percent of its platinum imports, 62 percent of its palladium imports and 38 percent of its rhodium imports from the Soviet Union. Only 0.4 percent of Japan's mineral fuel imports were from the Soviet Union in 1980.[30]

Recent development projects centered in Siberia and nearby areas have been the heart of Soviet-Japanese trade since 1968. Soviet need for advanced technology and equipment, which Japan can supply, to develop resources in Siberia, together with Japan's dependence on raw material imports and its proximity to the region, have driven the relationship. Under compensation agreements which have governed the projects, Japan has provided necessary equipment, services and credits and has received in return lumber, wood chips, pulp, coking coke resulting from the projects.

V. THE SOVIET-WESTERN TRADE FRAMEWORK

Because of the problems inherent in economic relations between market and centrally-planned economies, the industrialized Western countries and the U.S.S.R. have developed a trade framework that combines government and private sector involvement. This infrastructure is a mixture of agreements, institutions and organizations on two levels—government-to-government and firm-to-trade organization—reflecting the two-pronged nature of this trade.

A. GOVERNMENT-TO-GOVERNMENT PARTICIPATION

1. Bilateral agreements

The foundation of the trade framework is the series of bilateral agreements—trade pacts and cooperation agreements—which provide official support to business relations. The bilateral trade agreements set forth the general conditions for commerce including non-discriminatory tariff treatment. Through the agreements the partners also seek to eliminate trade barriers, encourage dispute settlements and facilitate commercial contact and representation. Japan, and most Western industrialized countries outside the Common Market, have trade agreements with the Soviet Union.

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[29] U.S. Government estimates.

[30] U.S. Government estimates.

The current U.S.S.R.-Japan Agreement, which was signed May 1981, covers bilateral commercial ties between the two countries for 1981–85, the U.S.S.R.'s 11th Five-Year-Plan period. The pact provides for Soviet exports of approximately 90 commodities such as wood, mineral fuels, cotton, and chrome and iron ores. Japan is to export around 70 commodities including iron and steel products, industrial plants, and chemicals. In addition the agreement stipulates that the two sides will use convertible currencies in their mutual transactions and will consult regularly. The agreement also sets out procedures for the settlement of commercial disputes.

The European Economic Community members also maintained bilateral trade agreements with the U.S.S.R. until the mid-1970's when the EC's Common Trade Policy entered into force. Under this policy all trade negotiations with the U.S.S.R. (and other centrally-planned-economy countries) must be carried out by the Community. This development added to the significance of another element in the Soviet-Western trade framework, the long-term economic, industrial and technical cooperation agreement (EITCA).

EITCA's, whose provisions and duration vary widely among different Soviet partners, provide an umbrella of government support for Western firms engaging in business cooperation with Soviet foreign trade organizations (FTO's). In the case of the Common Market members, this instrumentality has served to maintain the bilateral nature of economic relations with the U.S.S.R. in the absence of bilateral trade agreements. FRG, France, Italy, and the United Kingdom have cooperation pacts with the Soviet Union.

The first West German-Soviet trade accord was a pact signed in 1958 and called on West Germany to sell, among other things, steel products and various machinery and equipment in return for raw materials. The agreement also extended most-favored-nation status in mutual trade.

The 1972 FRG-Soviet Long-Term Agreement on Trade and Economic Cooperation was the first trade accord between the two states to go beyond simple trade relations into the broader area of economic, industrial, and technical cooperation. It called for the establishment of industrial complexes, modernization of individual industrial enterprises, and exchange of patents, licenses, and technical documentation. It also established the FRG-Soviet Mixed Commission. The most recent agreement was signed in 1978 for 10 years but is renewable for three additional five-year periods. Another long term cooperation pact was signed by both sides during the July 1980 Brezhnev-Schmidt Summit in Moscow and was intended to implement some of the objectives of the 1978 accord.

French-Soviet economic relations are governed by long-term cooperation agreements that set general guidelines for trade patterns from which specific economic pacts can be worked out. The present 10-year (1980-1990) Economic, Industrial and Technical Cooperation pact was signed in April 1979 during a summit meeting between French President Valery Giscard d'Estaing and Soviet President Brezhnev. It lays out a program of economic industrial and technical exchanges.

During the same meeting the two sides signed a 1980–85 economic cooperation pact which calls for a 3-fold increase in bilateral trade.

The Soviet-Italian Long-Term Program for Broader Economic and Industrial Cooperation signed October 29, 1975 is the umbrella agreement for economic relations between the two countries. The specific agreement on economic cooperation signed October 27, 1979 pledges both sides to provide official encouragement to cooperation between Italian firms and Soviet foreign trade organizations. Article V of the accord specifically states that the two countries will endeavor to expand and deepen cooperation in the production of new materials and energy. According to Article VII both parties shall facilitate the establishment of joint Soviet-Italian corporations in Italy and the opening of representative offices of individual Italian firms in the Soviet Union.

Also on October 12, 1979 the two governments signed a protocol to the umbrella agreement listing projects in which they expected to cooperate, e.g., Italian equipment for a Soviet nuclear power machine building plant, the Cheboksary Industrial Tractor plant, and Soviet equipment for Italian railroad construction.

The U.K-Soviet Long-Term (10-Year) Program in the Development of Economic and Industrial Cooperation was concluded in February 1975. As with other agreements mentioned, this accord is a pledge of general government support until 1985 from both sides for economic cooperation and specifies some areas in which such cooperation will be sought, e.g., in the Soviet chemical, oil refining and petrochemical industries, and the British railroad system.

2. Joint commissions

Joint economic and commercial commissions, another significant element in the Soviet-Western trade framework, have been established as inter-governmental bodies to facilitate cooperation between market and centrally-planned economies. These joint commissions have also created institutional and personal links between trade officials which provide a forum in the resolution of bilateral problems, a channel for business communication, and a means for identifying potential areas of economic cooperation.

These commissions usually meet annually—often at the ministerial level. Working groups created under commission auspices permit concentrated bilateral efforts in sectors of mutual interest.

The FRG-Soviet Mixed Commission was created in 1972 by the Cooperation Agreement. This body, while filling the general functions mentioned above, also provides for business representatives to participate in some aspects of the planning and working group meetings along with government officials.

The Soviets and French have two joint commissions both created in 1966. The "Grande Commission," a ministerial body, is tasked with working out general policy problems and formulating guidelines for cooperation. The "Petite Commission" is composed of working-level government officials and business representatives from both sides.

The Soviet Union also operates joint commissions with Italy and the United Kingdom. Japan has chosen not to follow suit reflecting its policy of minimizing direct government participation in business ties with the U.S.S.R.

3. Credit arrangements

To help support their firms' sales to the Soviet Union, many Western governments make available either officially backed credits at subsidized or below-market interest rates (according to OECD Gentleman's Agreement Guidelines) or credit guarantees and insurance. The credits are provided to the Soviet Union in terms of credit lines or on a project-by-project basis.

The FRG government does not grant subsidized credits but provides credit guarantees indirectly through the private insurance company, Hermes Kreditversicherung (AG). The FRG government through an interministrial committee chaired by the Economic Minister, makes all regulations and policy decisions concerning official support for export credits while Hermes acts as the government's export insurance system agent and manager. The government bears the risk.

The French extend export credits to the Soviet Union at "most favorable" rates under a 5-year agreement signed in February 1980. Under this pact the interest rates are adjusted annually in accordance with OECD consensus rates. The French official export credit system is operated through the government export bank, Banque Francaise du Commerce Exterieur (BFCE). The bank refinances export-related credits extended by French banks or French branches of foreign banks and also lends official export credits. The semiofficial export credit insurance agency· Compagnie Francaise d'Assurance pour le Commerce Exterieur (COFACE) provides insurance coverage for credits.

Japan has been extending official export credits to the U.S.S.R since 1968 through the Japanese Export-Import bank, a public corporation administerd by the government. All medium and long-term credits are provided by the bank rather than private institutions. No credits can be granted unless guaranteed by a government operated insurance agency run by the Ministry of International Trade and Industry (MITI).

Until 1980 Italy had provided the U.S.S.R. with a line of credit. Rome declined to renew this arrangement in protest of the Soviet invasion of Afghanistan. Subsidized export financing is now granted on a case-by-case basis to the Soviet Union. The official credit agency Medio-Credito refinances loans extended by private banks and that are guaranteed by SACE, the government insurance agency.

From 1975 to 1980 the U.K. government provided a line of credit to the U.S.S.R. at subsidized interest rates for imports of British-produced goods. London declined to renew the arrangement after it expired in protest of the Soviet invasion of Afghanistan. The Soviets still have access to U.K. government credit facilities on a project-by-project basis. Britain's Export Credit Guarantee Department (ECGD) refinances credits extended by British banks and provides credit insurance.

In July 1982 the OECD, which includes France, FRG, Italy, Japan and the United Kingdom, took actions which have increased the minimum interest rates at which members can offer official credits to the U.S.S.R. The organization reclassified recipient nations on a per capita income basis. The U.S.S.R. was moved from Category II (intermediate) to Category I (relatively rich), the group of recipients receiving official loans at the highest minimum interest rates. OECD also raised the minimum rates offered to Category I countries across the board.

B. FIRM-TO-FTO OPERATIONS

1. Cooperation agreements

Day-to-day operations of Soviet-Western trade are conducted by Western firms and Soviet FTO's. While most of this trade consists of individual export and import transactions, a substantial amount is carried on through industrial cooperation arrangements (ICA) or countertrade agreements. They are designed to make possible Soviet purchases without immediate expenditures of hard currency. An ICA is a long-term complex contract between a western firm and a Soviet FTO under which the former supplies certain assets, e.g., machinery, technology, licenses, complete plants, to the latter, usually on credit, in joint production projects. The compensation agreement is one type of ICA under which the Western partner purchases products resulting from the cooperative production project.

The U.S.S.R. has entered into approximately 45 compensation agreements with Western firms. Among the most important have been the gas-for-pipe deals with French, West German and Italian firms, including the Yamal pipeline project.

The West European-Soviet, or Yamal, natural gas pipeline project is covered in detail in another chapter of this volume. However, we will briefly mention it here for the sake of completeness and because of the project's importance to Soviet-I.W. trade.

The project involves the construction of a pipeline to carry gas from the Urengoy fields in Western Siberia to Western Europe, a distance of some 3,500 miles. The FRG, France, and Italy are among the participants along with Austria, Belgium and the Netherlands. To date only gas companies from the FRG and France have signed contracts with the Soviets to buy from pipeline. Italy is still in the negotiating stage. Belgium and the Netherlands have essentially pulled out all together because the Soviets failed to sign contracts with their firms for equipment for the line. The cost of Yamal has been estimated at $10–15 billion for imported pipe and equipment and around $15 billion for Soviet domestic inputs.[31] Western European countries and Japan have extended credits for purchases of equipment and pipe. The lines of credit cover 85% of the cost of the equipment.

Firms from France, West Germany, Italy, and Japan have contracted to sell machinery and equipment, including compressor stations and pipelayers for use on the pipeline. West Germany and Japan are also supplying large-diameter pipe.

If fully operational, Yamal would increase the dependence on some West European countries on Soviet gas imports: 25–30 percent of West German, 20–25 percent French and 25–30 percent Italian supplies of natural gas could be of Soviet origin by the end of the decade. Total energy dependence of these countries on the U.S.S.R. would be in the neighborhood of 4 to 8 percent.

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[31] New York Times, April 1, 1982.

The U.S.S.R. also has major arrangements with Japanese firms to supply the Soviet Union with equipment for use in the development of resources in Siberia and off the coast of Siberia in exchange for timber, wood pulp, coal, oil, and gas.

The Sakhalin oil and gas project, currently in the exploratory phase, is one such joint project. In January 1975 the U.S.S.R. and the Sakhalin Oil Development Cooperation Co., Ltd. (SODECO) (a consortium of the Japanese government and private Japanese firms) signed an agreement involving the production of oil and gas off the coast of the Soviet-occupied Sakhalin Island north of Japan. Actual production is not expected to begin until the late 1980's.

Other examples of firm—FTO long-term business arrangements are the Rhone-Poulenc (French) 10-year agreement in helping the development of the Soviet chemical industry, Fiat's long-term relationship with modernizing the U.S.S.R. passenger auto industry and the pact between the British firm Imperial Chemical Industries (ICI) and the U.S.S.R.

2. *Business councils*

Western businesses active in Soviet trade have established business councils or joint chambers of commerce with representatives of the U.S.S.R. All Union Chamber of Commerce and Industry and of Soviet foreign trade organizations as a mechanism to help iron out difficulties arising in their business dealings and to facilitate mutual trade. Often these councils have working groups which seek to expand commerce in specific areas. Chambers of Commerce exist between Soviet organizations and businesses in France and Italy.

The Soviet business council with Japanese firms, the Japan-Soviet Economic Cooperation Council, is especially important given the absence of a government-level joint commission. It acts as the sole monitoring group of the cooperation agreement between Japan and the Soviet Union. A subcommittee of the Council is charged with overseeing the various Japanese development projects with the Soviets.

VI. PROSPECTS FOR SOVIET-WESTERN TRADE

The outlook for Soviet-Western trade is uncertain as it is a function of several unpredictable variables. These factors include, on the Soviet side, domestic needs, hard currency earnings, and economic conditions within Eastern Europe, and, on the Western side, political relations with the Soviet Union and domestic economic conditions.

The U.S.S.R.'s 11th Five-Year Plan (1981–85) does not include a figure for expected foreign trade growth, but it provides an indication of the economic sectors in which foreign commerce will play a role. The energy sector will be critical to Soviet development as the U.S.S.R. is faced with stagnant or declining production of oil and coal. Moscow will seek to increase natural gas production for domestic use and export. It will require advanced equipment and technology along with supplies of pipe and ancillary items for which Western nations are primary suppliers.

The Soviets will also look to developing their food, chemical, and machine-building industries and to modernizing their long-distance transportation system. While Eastern Europe can be expected to supply some of the equipment and technology for these areas, Moscow still must look to Western firms as sources of high quality items unavailable in the East. The importance the Soviet Union has given to long-term cooperation projects such as the Yamal pipeline, is evidence of the Soviet need for Western goods and services.

The Soviet Union has been incurring hard currency difficulties because of soft markets for major hard currency exports (oil, gas, gold, diamonds), imports of large volumes of grain due to three consecutive poor harvests, and hard currency loans to Poland. In the short-run these constraints will force Soviet decisionmakers to retard imports of investment goods in order to be able to buy immediately necessary commodities such as food. In the long term, severe hard currency limitations could be expected to force Moscow to redirect more of its trade eastward. The downturn in growth rates of Soviet-Western trade observed earlier is likely to continue.

VII. Summary and Conclusions

Soviet Western commercial relations have recently received much attention. This paper has provided an overview of those ties focusing on the economic relations of the FRG, France, Italy, the United Kingdom, and Japan with the U.S.S.R. The following are some of the key conclusions that were derived:

In the late 60's and early 70's Soviet policy makers assigned a more important role to Western trade in their country's economic development than had been the case in the past.

The five Western countries mentioned above have tended to isolate economic ties from their political relations with the Soviet Union.

The U.S.S.R.'s trade with the West grew rapidly in the 70's but the rate of growth has tapered off in the beginning of the 1980's indicating its expansion is not limitless. The Soviet Union has concentrated its imports from the West in certain key sectors, e.g. steel, machinery and equipment. Its exports to the West have been mostly raw materials, especially energy.

For all five Western countries, trade with the Soviet Union represents a small fraction of their total world trade. Dependence on Soviet business is concentrated in select sectors, e.g. imports of Soviet energy and exports of steel to the U.S.S.R.

The Soviet Union and its Western trade partners have developed a trade framework that combines government and private sector involvement to ease some of the difficulties inherent in economic relations between market and centrally-planned economies.

The outlook for Soviet-Western trade is uncertain as it is a function of several unpredictable variables.

U.S.S.R.: HARD CURRENCY TRADE AND PAYMENTS

By Joan Parpart Zoeter[*]

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I. INTRODUCTION[*]

After suffering a deterioration in its hard currency trade and payments position in 1981, the U.S.S.R. was able to sharply reduce the deficit in first half 1982 only by an extraordinary increase in oil exports and a continuation of import curbs. The erosion of Moscow's hard currency payments position in 1981 was due to the evaporation of the U.S.S.R.'s main source of increased hard currency earnings—soaring world oil prices. After a successful attempt to hold the hard currency debt down in 1977–80, the U.S.S.R. was hit in 1981 by a soaring agricultural import bill, soft oil prices in the West, and the need to increase aid to Poland. To ease its financial bind, the Soviet Union since the summer of 1981 has reexamined its import requirements and greatly increased its use of short-term bank credits for grain and other commodities. The Soviet net hard currency debt to the West rose by about $3 billion in 1981, to an estimated $12.5 billion at yearend.[1]

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[*] Analyst, Office of Soviet Analysis, Directorate of Intelligence, Central Intelligence Agency. This paper draws heavily on estimates by Richard Bieler of Soviet debt and debt service. The author wishes to express her appreciation to Joan McIntyre and Martin Singer of the Office of Soviet Analysis, CIA, for their help in compiling many of the statistics presented here. This paper was completed in February 1983.

Although the U.S.S.R.'s hard currency position is still relatively strong—the debt service ratio is less than 20 percent—Moscow is not taking the turnaround in its fortunes lightly. A natural conservatism, heightened by the Polish example, has made the Soviet fincial planners wary of sharp increases in foreign debt. In part to keep the growth in debt down, Moscow cut back on non-agricultural imports in 1981. Perhaps more importantly, the hard currency pinch has begun to impinge on Moscow's willingness to help out its East European partners. The U.S.S.R. late last year decided to reduce—by perhaps 10 percent—its highly subsidized exports of crude oil to Czechoslovakia, East Germany, and Hungary.

One of the serious problems facing the Soviet leadership in the 1980s is how to deal with hard currency shortages at a time of increasing economic stringency at home. The outlook for increased earnings from exports is poor, and Moscow is not likely to permit its debt to rise above a point which it considers manageable. Thus, the U.S.S.R. may have little choice but to curb hard currency imports. Although the weight of these in total Soviet economic activity is small, hard currency imports play an important role in easing food shortages, raising energy production, sustaining technological advances and productivity, and making up for unexpected shortfalls of key products. If forced to reduce imports, the Soviets will than have to decide whether to concentrate such cuts on the nonagricultural or agricultural areas. Moscow will also be faced with the choice of whether or not to further reduce subsidized sales of goods such as oil to Eastern Europe in order to keep up its own hard currency exports. While such an action would provide relief to the Soviet account, it would also force the East Europeans to increase sharply their hard currency oil purchases or cut back on domestic consumption.

II. TRADE DEVELOPMENTS

Internal Soviet economic policy decisions as well as detente contributed to the surge in Soviet-Western commercial relations in the 1970s. As postwar productivity gains evaporated and domestic growth slowed early in the decade, Moscow turned to the West for equipment and technology to spur the economy. Expectations were also high in the West, where businessmen hoped to sell equipment and technology from underemployed capital goods industries and to develop a large and growing market for consumer goods in the U.S.S.R. The Politburo's decision to give full support to the Brezhnev program for upgrading the Soviet diet was an added sign that more attention would be given to the consumer, which would in turn require large Soviet imports of Western agricultural goods. For its part, the West viewed the U.S.S.R. as an important new source of energy supplies as well as a supplier of timber, various ores and metals, diamonds, and other raw materials.

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[1] Unless otherwise noted, references to the U.S.S.R.'s trade and debt are to its hard currency position with non-Communist countries (see Appendix A). Reporting on that part of Soviet trade and payments with other Communist countries which is conducted on a hard currency basis is far from complete.

Because of increasing reliance on the West for equipment and grain, the U.S.S.R. incurred large trade deficits in the mid-1970's. Concern over these deficits and the rapidly rising hard currency debt led Moscow in 1977 to begin to curb imports from the West. The main impact was on imports of machinery and equipment, which in real terms fell an estimated 20 percent in 1977-80 (see Appendix B). Moscow was greatly aided in its efforts to narrow the trade gap by good harvests in 1977-78 and the resulting drop in agricultural imports and by the spiraling world oil prices in 1979-80 which allowed a surge in oil export earnings in spite of a falling volume (see Figure 1 and Appendix C). Thus, in 1977-80, the hard currency trade deficit was held down to $2.9 billion a year on average compared with $6.0 billion a year in 1975-76 (see Table 1).

Figure 1
USSR: Growth of Hard Currency Oil Exports

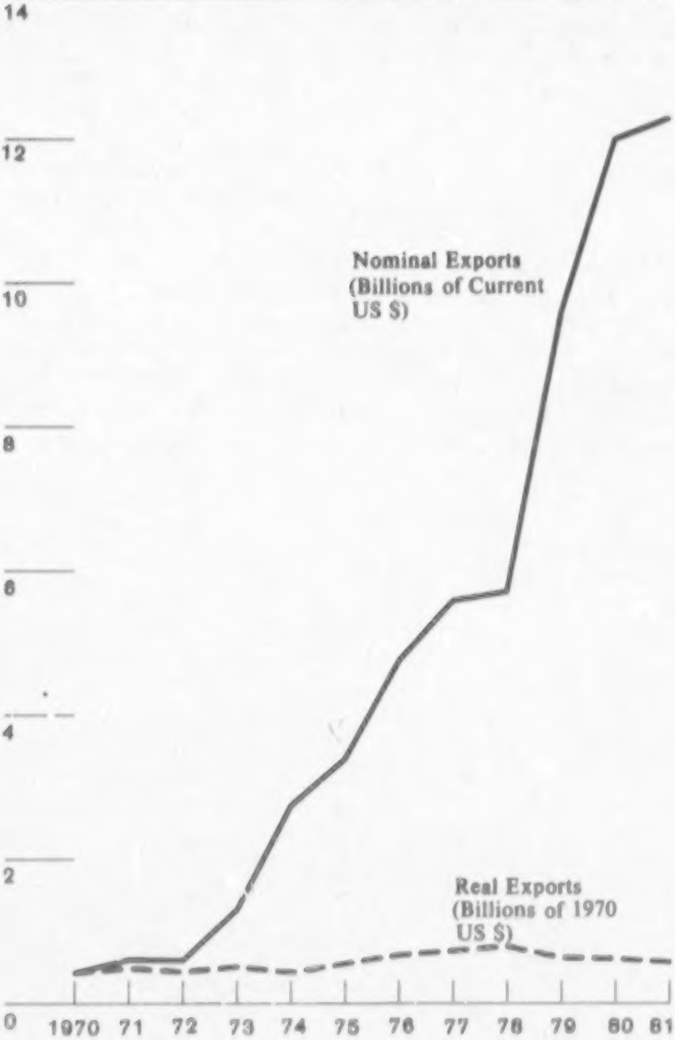

TABLE 1.—U.S.S.R.: ESTIMATED HARD CURRENCY BALANCE OF PAYMENTS

[In millions of U.S. dollars]

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981[1]
Current account balance	260	390	521	528	1,488	−4,607	−3,216	462	422	2,178	1,904	−100
Trade balance	−560	−317	−1,388	−1,735	−826	−6,297	−5,223	−2,942	−3,690	−2,018	−2,486	−4,000
Exports, f.o.b	2,424	2,776	2,954	5,009	7,869	8,280	10,225	11,863	13,336	19,417	23,584	23,778
Imports, f.o.b	2,984	3,093	4,342	6,744	8,695	14,577	15,478	14,805	17,026	21,435	26,070	27,778
Net interest	−80	−48	−60	−80	−103	−570	−724	−848	−881	−799	−710	−1,300
Additional military deliveries to LDCs, f.o.b.[2]	400	400	600	1,600	1,500	1,500	1,850	3,220	3,965	3,855	4,200	4,200
Other invisibles and transfers	500	355	327	743	917	760	911	1,032	1,028	1,140	900	1,000
Capital account balance	NA	NA	−57	611	488	5,797	2,519	1,212	−788	−1,152	48	3,240
Gross drawings[3]	NA	NA	906	1,737	2,052	6,371	5,495	2,857	3,096	4,474	2,865	6,300
Government backed	450	511	425	495	1,164	1,972	2,450	1,991	2,565	2,410	2,195	2,100
Commercial	NA		481	1,242	888	4,399	3,045	866	531	2,064	670	4,200
Repayments	NA	NA	306	397	625	969	1,365	1,955	2,332	2,800	3,051	3,200
Government backed	159	223	276	338	483	730	1,035	1,285	1,456	1,702	1,915	2,000
Commercial	NA		30	59	142	239	330	670	876	1,098	1,136	1,200
Net change in assets[4]	NA	NA	−629	−729	−939	395	−1,611	310	−1,552	−2,826	234	140
Gold sales	([5])	24	289	962	1,178	725	1,369	1,618	2,522	1,490	1,580	2,700
Net errors and omissions	NA	NA	−753	−2,101	−3,154	−1,915	−672	−3,292	−2,156	−2,516	−3,532	−5,840

[1] Provisional estimate.

[2] This item excludes the value of arms related commercial exports included in Soviet reporting on exports to individual LDCs.

[3] Including additions to short-term debt.

[4] Net change in Soviet assets held with Western commercial banks (a negative sign signifies an addition to assets).

[5] Negligible.

By 1981, however, soaring agricultural import needs due to the third poor harvest in a row and soft world oil prices led to a weakening of the Soviet hard currency position as the trade deficit rose to $4 billion, up from $2.5 billion in 1980. Apparently caught unawares by the unusually high deficit in the first half of the year and unable to quickly trim imports, Moscow was forced to resort to an extraordinary drawdown of assets in Western banks. The deficit for the entire year would have been even higher had Moscow not trimmed imports in the last half of the year to help achieve a $2 billion surplus. For the year as a whole, the volume of non-agricultural imports—which had risen in 1979–80 after declining in the previous two years—fell back to the 1978 level. The volume of machinery imports fell by roughly 30 percent and imports of steel other than pipe by perhaps 10 percent. In spite of these import cuts, however, Moscow decided to engage in both heavy borrowing and large gold sales in the second half of the year and thus was able to rebuild its bank assets to nearly their previous high level. Successful efforts to slash the trade deficit in first half 1982 permitted the Soviets to hold down the growth of the net hard currency debt.[2]

A. IMPORTS

Purchases from the West rose nearly ninefold in value terms between 1970 and 1980, boosting the share in total Soviet imports from 23 percent to 38 percent (see Appendix D). In volume terms, however, hard currency imports increased only twofold and were roughly 30 percent of total imports in 1980.[3] Purchases of machinery, ferrous metal products, and farm products—especially grain—have dominated Soviet imports.

Although the U.S.S.R. has had considerable difficulty in assimilating the equipment and technology it bought from the West, these imports unquestionably have helped Moscow deal with some critical problems, particularly in certain manufacturing sectors. In the 1970's, imported chemical equipment, accounting for about one-third of all Western machinery purchased by the Soviets, was partially or largely responsible for doubling the output of ammonia, nitrogen fertilizer, and plastics and for tripling synthetic fiber production. In the late 1970's, for example, half of Soviet ammonia output was from Western plants.[4] Nor could the Soviets have accomplished their ambitious 15-year program of modernization and expansion in the motor vehicle industry without Western help. The Fiat-equipped VAZ plant, for example, produces half of all Soviet passenger cars,[5] and the Kama River truck plant accounts for a similar share of Soviet heavy truck output. Moreover, the Soviets have imported large numbers of Western computer systems and minicomputers.

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[2] Foreign Trade, U.S.S.R., No. 9, 1982, U.S.S.R. Ministry of Foreign Trade, Moscow.

[3] Soviet trade data supplemented by estimates indicate that between 1970 and 1980 import prices on average rose 11 percent a year in hard currency trade, 9 percent in non-hard currency trade with the West, and 6 percent in trade with other Communist countries. The average annual price increase for total imports was 8 percent.

[4] Philip Hanson, Trade and Technology in Soviet-Western Relations, Columbia University Press, New York, 1981.

[5] Toli Welihozkiy, "Automobiles and the Soviet Consumer," Soviet Economy in a Time of Change, Vol. 1, Joint Economic Committee of the Congress of the United States, Washington, D.C. Oct. 10, 1979, p. 813. See also, Imogene Edwards and Robert Fraser, "The Internationalization of the East European Automotive Industries," Eastern European Economics, Post-Helsinski, Joint Economic Committee of the Congress of the United States, Washington, D.C., Aug. 25, 1977, pp. 396–419.

Imports from the West also have played a key role in supporting the energy sector. Soviet deficiencies in drilling, pumping, and pipeline construction led the U.S.S.R. to purchase about $5 billion worth of oil and gas equipment in the 1970s. In addition, West Germany and Japan provided virtually all the large-diameter pipe needed for gas pipeline construction.

In the case of agricultural imports, Soviet grain imports jumped from an average of 11 million tons a year in 1971–75 to 17 million tons a year in 1976–78, 27 million tons a year in 1979–80, and 39 million tons in 1981.[6] By 1981, grain purchases coupled with record imports of meat, sugar, vegetable oil, and soybeans and meal totalled $12 billion and accounted for two-fifths of hard currency merchandise imports. Without Western grain, Soviet consumers would not have had the increase in meat consumption they realized in the early 1970s, and there would have been a sharp drop in per capita consumption of meat in the late 1970s instead of a leveling off.

B. EXPORTS

Price increases have accounted for more than nine-tenths of the 10-fold rise in Soviet hard currency exports since 1970 (see Figure 2). Because export prices grew on average twice as fast as import prices, the terms of trade improved at an average annual rate of 8 percent (see Table 2). Soaring prices for oil accounted for more than one-half of the rise in total exports and increased gas prices for another one-tenth. The volume of Soviet hard currency exports has grown by only 45 percent since 1970—an average of 6 percent a year in 1971–79 followed by a decline of 14 percent in 1980–81.

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[6] The U.S.S.R. also imports some grain for soft currency, mainly from Eastern Europe. In 1981, such imports totalled about 1 million tons.

Figure 2
USSR: Growth of Hard Currency Trade

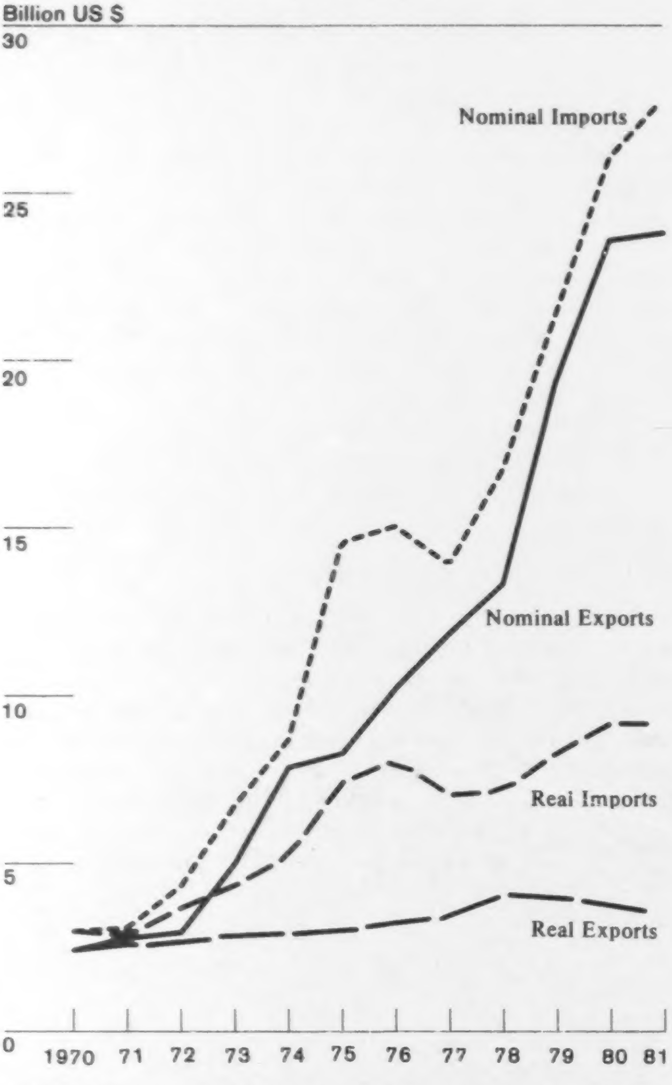

TABLE 2.—U.S.S.R.: ESTIMATED PRICE TRENDS IN HARD CURRENCY TRADE

[Annual increase in percent]

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Exports	7.2	8.5	46.6	58.7	4.0	8.9	15.4	−7.3	47.7	30.2	9.0
Imports	8.6	8.8	31.3	7.3	18.0	−5.3	5.8	18.7	10.3	10.1	6.2
Terms of trade	−1.3	−0.3	11.7	47.9	−11.9	2.9	9.1	−21.9	33.9	18.3	16.0

The volume of oil exports (including petroleum products) to hard currency trading partners peaked at 1,100,000 b/d in 1978 and dropped to about 900,000 b/d by 1981 (see Appendix E) as domestic output growth tapered off. (Crude oil accounts for about three-fifths of Soviet oil exports to hard currency countries.) As a result of the much greater increase in oil prices (19-fold over the past decade) than in prices of non-oil exports (less than five-fold) the value of oil in total Soviet hard currency exports climbed from 18 percent in 1970 to 52 percent in 1981. The volume of oil exports as a share of total real hard currency exports, on the other hand, remained at less than 20 percent. Real exports of natural gas, which climbed from only 100 million cubic feet/day in 1970 to 2.1 billion cubic feet/day in 1979–80 and 2.3 billion cubic feet/day in 1981. The volume of exports of wood and wood products and of diamonds stagnated throughout much of the period, while sales of ferrous metals and agricultural products rose moderately in 1971–75 before falling through 1980. In the case of wood and wood products, labor and equipment shortages have limited the harvesting of timber, which must come from increasingly remote areas, while rising domestic demand for lumber and paper products has caused persistent domestic shortages of these products in the past several years.

Chemical exports grew dramatically in the 1970's but still account for only 3 percent of total hard currency exports. Most of the growth resulted from buy-back deals under which Western firms provided the plant and equipment in return for future product exports.[7] In fact, Western help has allowed the U.S.S.R. to become the world's leading ammonia exporter—about 2 million tons were exported in 1980. Exports of other chemicals are not as large. Nevertheless, Western chemical exporters already have begun to worry about the rising sales of Soviet polyethylene in their markets.[8]

Exports of machinery and equipment—sold mainly to LDCs—more than quadrupled in real terms in 1971–78 and then declined somewhat as sales to Iraq fell. Iraq, with whom Soviet relations are now tenuous at best, has in fact been the largest customer for the USSR's machinery and equipment. In 1980, transportation equipment accounted for 32 percent of Soviet hard currency exports of machinery and equipment, with automobiles alone accounting for 13 percent. Most Soviet machinery is not well suited to Western markets, nor is it backstopped by a developed network for service or spare parts. While the Soviets can mass produce, at low cost, simple machinery and equipment such as standard machine tools and have enjoyed some success in exporting such products to the West, the market for these products has been stagnant in recent years and competition from newly industrialized countries is growing. In addition, given the growing stringencies in steel and other raw material supplies within the USSR, Soviet machine builders have all they can do to meet the demands of the domestic economy.[9]

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[7] See V. Sobeslavsky and P. Beazley, the Transfer of Technology to Socialist Countries: The Case of the Soviet Chemical Industry, Oelgeschlager, Gunn & Hain, Publishers, Inc., Cambridge, Mass., 1980.

[8] European Chemical News, March 30, 1981, p. 12.

[9] See Richard Flynn and Lee Bettis, "Sluggish Soviet Steel Industry Holds Down Economic Growth" in this compendium.

III. OTHER TRANSACTIONS

Since the mid-1970s, sizable earnings from sales of arms and gold have permitted the U.S.S.R. to hold down its use of Western credits while earnings from interest on Soviet assets in Western banks and from invisibles and transfers have usually offset interest payments on the debt. Since the early 1970s the U.S.S.R. has become a major supplier of military equipment to the less developed countries. The estimates in Table 1 indicate that hard currency receipts from such sales rose from about $400 million at the beginning of the decade to $1.6 billion in 1973 and $4.2 billion in 1981 (see Appendix F). Throughout this period, the Arab countries have been the principal customers for Soviet arms.

Net earnings from transportation services—which have averaged less than $1 billion a year—have been disappointing and probably have fallen substantially in real terms. This estimate of the transportation account reflects earnings by the Soviet merchant fleet and by the Trans-Siberian Landbridge Service and expenditures by the U.S.S.R. for the carriage of grain and other imports on foreign ships. Other transactions such as those involving air passenger traffic and overland transit services for freight moving between Europe and Iran are excluded because data are skimpy and the sums involved are believed to be small. Hard currency receipts from tourism probably do not exceed $300-$400 million. Data on transfer payments are available only for Soviet contributions to the United Nations, which have averaged about $150 million a year. After averaging about $800 million a year during 1976-80, net outflows on interest payments rose to about $900 million in 1981 as the U.S.S.R. sharply increased its borrowing.

In Table 1, gold sales are reported separately rather than in the current account because in practice the Soviets tend to market their gold directly according to the need for financing. Gold traditionally has ranked as one of the U.S.S.R.'s top hard currency earners, with cumulative receipts in the 1970s netting Moscow $15 billion—an amount equal to about 10 percent of Soviet hard currency outlays—since 1970. In 1980, the U.S.S.R. had a gold inventory of about 1,800 tons. During the 1970s the U.S.S.R., which ranks second only to South Africa as a producer and marketer of gold, accounted for one-third of annual world gold production and about one-fourth of the newly mined gold moving in world trade.[10]

Soviet gold sales rose from an average of about 210 tons a year in 1972-75 to 370 tons a year in 1976-78 (see Appendix G). Moscow was able to reduce average annual gold sales to about 150 tons in 1979-80 as it reaped the windfalls from both soaring oil and gold prices. The emerging hard currency bind in 1981 forced Moscow to boost the volume of gold sales from an estimated 80 tons in 1980 to about 200 tons. The gain in value terms—from $1.6 billion in 1980 to $2.7 billion in 1981—was not as great, however, as the average price dropped from $600 to $400 a troy ounce.[11]

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[10] Handbook of Economic Statistics: A Research Aid, National Foreign Assessment Center, NF HES 81-001, November 1981, p. 134.

[11] We have relied on the Annual Bullion Review for our estimates of the volume of gold. The accuracy of these derived value estimates depends on the degree of fluctuation in the market prices within a given year and the timing of Soviet sales about which little information is available.

When all of the line items are added up and net financing received is taken into account, estimates of sources of hard currency differ substantially from known or estimated expenditures. This calculated residual ("errors and omissions" in Table 1) in most years implies a net hard currency outflow for the Soviets. Apart from the likelihood that estimating errors are substantial, the residual reflects the exclusion from the accounts (because of substantial information gaps) of the U.S.S.R.'s:

(a) hard currency assistance to other Communist countries,

(b) hard currency trade with the other Communist countries,

(c) net credits granted to LDCs to finance Soviet sales of machinery and equipment, including military equipment,

(d) net credits—mainly short term—provided to the developed West to finance sales of oil and other commodities, and

(e) hard currency expenditures in support of Communist parties and terrorist activities in the West.

In the case of hard currency assistance to Poland, such assistance may have totalled $300 million in 1980 and close to $1 billion in 1981. The U.S.S.R. incurred a $500–$600 million deficit in 1981 in its hard currency trade with Hungary, the only East European country which provides sufficient data to make such an estimate. Estimated drawings on Soviet hard currency credits for machinery and equipment (excluding military) sales to the LDC's averaged about $500 million a year in 1976–81.[12] LDC repayments to the U.S.S.R. averaged an estimated $225 million a year, yielding net credits of $275 million a year. The amount outstanding at any one time on credits for oil sold to the developed West—assuming 30-day terms—could have been as high as $1 billion in 1980–81, up from $800 million in 1979 if the same terms are assumed. If in 1981 soft world demand forced the U.S.S.R. to offer more favorable credit terms for oil, the amount outstanding could have been substantially higher.

Errors and omissions indicate a consistent understatement of Soviet expenditures. The unaccounted for net hard currency outflow rose from an average $2.9 billion a year in 1977–79 to $5.8 billion in 1981. Roughly one-fourth of this increase came from stepped up aid to Poland, but we cannot pinpoint the rest of it.

IV. THE DEBT

Borrowing required to cover Soviet deficits pushed the net hard currency debt up from $600 million at the end of 1971 to $11.2 billion at the end of 1977 (see Table 3). A determined campaign to curb the rise in debt resulted in a drop to $9.3 billion by the end of 1980.[13] But the jump in the trade deficit due to soaring agricultural imports and soft world oil prices together with extraordinary aid to Poland in 1981 led to a $3.2 billion rise in the net debt to $12.5 billion by year's end.[14, 15]

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[12] It has been assumed that credits were used to finance 60 percent of machinery and equipment delivered to the U.S.S.R.'s multilateral LDC partners. Repayments were assumed to be spread over eight years on average. The amount owed the Soviets at yearend 1981 is estimated at more than $2 billion.

[13] For a discussion of the Soviet effort to hold down borrowing, see Paul G. Ericson and Ronald S. Miller, "Soviet Foreign Economic Behavior: A Balance of Payments Perspective, "Soviet Economy in a Time of Change, vol. 2, Joint Economic Committee, Congress of the United States, Washington, D.C., Oct. 10, 1979.

TABLE 3.—U.S.S.R.: ESTIMATED HARD CURRENCY DEBT TO THE WEST

[In millions of U.S. dollars, yearend]

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981[1]
Gross debt	1,808	2,408	3,748	5,175	10,577	14,707	15,609	16,373	18,047	17,861	20,900
Commercial debt	407	858	2,041	2,787	6,947	9,662	9,858	9,513	10,479	10,013	13,000
Government and Government-backed debt	1,401	1,550	1,707	2,388	3,630	5,045	5,751	6,860	7,568	7,848	7,900
Assets in Western banks	1,225	1,854	2,583	3,522	3,127	4,738	4,428	5,980	8,806	8,572	8,430
Net debt	582	555	1,165	1,654	7,450	9,969	11,181	10,393	9,241	9,289	12,470

[1] Provisional estimate.

Nearly two-thirds of the increase in the U.S.S.R.'s gross debt since 1971 originated in private borrowing from commercial banks and other commercial sources.[16] It was not until the U.S.S.R. began to experience huge trade deficits in 1975, however, that commercial borrowing exceeded Soviet assets in Western banks (see Table 4). After a dramatic improvement in the U.S.S.R.'s net liability position (from an average $4.7 billion a year in 1975–77 to $1.4 billion a year in 1979–80), Soviet net commercial debt rose to $4.0 billion in 1981 as Moscow's hard currency payments position weakened. In the first half of 1982, however, the growth of the net debt slowed sharply as the U.S.S.R. slashed its hard currency trade deficit. Much of the increase in the Soviet commercial debt in the mid-1970's was the result of large syndicated general purpose loans. Because of its wish to hold down its debt and avoid prevailing high interest rates, the U.S.S.R. has not engaged in such borrowing since 1979, when it consolidated earlier syndicated loans into one large credit. Most of the sharp rise in commercial debt in 1981, on the other hand, probably was the result of short-term credits—mostly for grain.

TABLE 4.—SOVIET COMMERCIAL DEBT

[In millions of U.S. dollars, yearend]

	Assets	Liabilities	Net assets
1971	1,225	407	818
1972	1,854	858	996
1973	2,583	2,041	542
1974	3,522	2,787	735
1975	3,127	6,947	−3,820

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[14] These point estimates of Soviet hard currency debt to the West should be viewed as falling within a probable range of plus or minus 10 percent. For a discussion of the methodology used in deriving these debt estimates, see appendix H.

[15] Because the U.S. dollar depreciated considerably between 1975 and 1979, the growth of the Soviet hard currency debt to the West would be substantially less if the exchange rate flucutations were taken into account. It is estimated that the net debt at yearend 1979 would have been $7 billion (instead of $9.6 billion) in terms of 1975 U.S. dollars. The appreciation of the U.S. dollar vis-a-vis other currencies in 1980–81 would result in a 1981 debt of $8.8 billion in 1975 U.S. dollars and $13.3 billion in 1979 U.S. dollars (instead of $12.5 billion in current U.S. dollars).

[16] About three-fourths of the U.S.S.R.'s commercial debt represents borrowing from Western commercial banks within the Bank for International Settlements (BIS) reporting area with the remainder consisting of promissory notes and other supplier credits held by institutions other than banks and by banks outside of the BIS area.

TABLE 4.—SOVIET COMMERCIAL DEBT—Continued

[In millions of U.S. dollars, yearend]

	Assets	Liabilities	Net assets
1976	4,738	9,662	−4,924
1977	4,428	9,858	−5,430
1978	5,980	9,513	−3,533
1979	8,806	10,479	−1,673
1980	8,572	10,013	−1,141
1981	8,430	12,470	−4,040

Source: Estimates based on Bank for International Settlements (BIS) data.

Soviet assets with Western banks averaged $8.6 billion at the end of each of the previous three years. Although in recent years Moscow has relied on a sizable drawdown of these assets to finance large deficits in the first half of each year, it has built them up again by year's end. Even in 1981, when a huge deficit necessitated and unprecedented $5-billion drawdown of assets in January–June, the U.S.S.R. borrowed heavily in July–December to rebuild them. Moscow apparently feels uncomfortable if these assets fall much below four months worth of hard currency merchandise imports. Moreover, it may well believe that keeping assets high will help maintain its still relatively good credit rating.

Soviet debt on Western official and officially backed credits—which since 1975 has grown more rapidly than debt arising from commercial credits—accounts for two-fifths of total gross debt. Since the U.S.S.R. began large purchases of Western technology in the early 1970's, Moscow has used official and officially backed credits to finance one-third of its imports of plant, equipment, and large diameter pipe from the West. Annual Soviet drawings on government-backed credits jumped from an average of $475 million in 1971–73 to nearly $2.5 billion by 1976 but have since been held at that level or less. (see Table 5). The volume of new commitments fell from a peak of over $4 billion in 1976 to less than $2 billion in 1980, reflecting falling Soviet orders for Western machinery and equipment (see Appendix I). In 1981, new commitments turned up sharply as a result of business connected with the new Siberia-to-Western Europe gas pipeline. Subsidized interest rates and the long maturities attached to most government-backed credits have helped Moscow conserve some scarce hard currency. The interest rate subsidy reached a record level in 1981—on the order of $300–$400 million—as commercial rates in most Western countries averaged 6 percentage points more than those charged on official loans.

TABLE 5.—U.S.S.R.: ESTIMATED DEBT ON WESTERN GOVERNMENT AND GOVERNMENT-BACK CREDITS

[in millions of U.S. dollars, yearend]

	New commitments	Drawings	Undrawn commitments	Principal repayments	Interest payments	Yearend position	
						Outstanding debt	Total commitments
1970	612	450	691	159	83	1,113	1,804
1971	373	511	615	223	106	1,401	2,016
1972	777	425	1,020	276	119	1,550	2,570
1973	1,415	495	2,704	338	133	1,707	4,411

TABLE 5.—U.S.S.R.: ESTIMATED DEBT ON WESTERN GOVERNMENT AND GOVERNMENT-BACK CREDITS—Continued

[In millions of U.S. dollars, yearend]

	New commitments	Drawings	Undrawn commitments	Principal repayments	Interest payments	Yearend position	
						Outstanding debt	Total commitments
1974	3,585	1,164	4,959	483	187	2,388	7,347
1975	2,311	1,972	5,395	730	284	3,630	9,025
1976	4,404	2,450	6,395	1,035	424	5,045	11,439
1977	2,892	1,991	7,923	1,285	492	5,751	13,674
1978	1,998	2,565	8,557	1,456	590	6,860	15,417
1979	2,292	2,410	6,748	1,702	670	7,568	14,316
1980	1,510	2,195	7,471	1,915	730	7,848	15,319
1981 [1]	NA	2,070	NA	2,000	750	7,900	NA

[1] Provisional.

In determining the U.S.S.R.'s net debt to the West, the only Soviet assets taken into account are deposits in Western banks. Moscow is owed sizable amounts on trade and development credits extended to both the LDCs and the developed West and on credits to cover arms sales to the LDCs. In addition, the U.S.S.R., as mentioned above, has large gold reserves, worth more than $20 billion at $350 a troy ounce.

Unfortunately, sufficient information is not available to estimate the breakdown of the U.S.S.R.'s hard currency debt by creditor. U.S. publications say that the Soviet Union owes $550 million net of Soviets assets to domestic and major foreign branches of U.S. banks,[17] $400 million to the Export-Import bank,[18] and $662 million on Lend Lease extended in 1945.[19] A West German Bundesbank report indicates that as of 31 March 1982, net liabilities to German banks and their foreign branches were $1.5 billion.[20] From Bank of England data, we estimate Soviet net debt to British banks was $1.8 billion as of end-June 1981.[21]

Debt size reveals little about a country's ability to meet its financial obligations and to sustain needed imports. To provide perspective on the U.S.S.R.'s debt, several indicators of the hard currency debt have been calculated—all of which show that the Soviet position remains quite manageable (see Table 6). Using the ratio of repayments on medium- and long-term debt plus interest on total debt to merchandise exports shows that, after rising to 27 percent in 1977-78 following heavy borrowing in the previous two years, the debt service ratio fell to 20 percent in 1980 but rose to 23 percent in 1981 as exports stagnated. This ratio still compares extremely favorably, however, with the 1981 debt service ratios for most East European countries, which we estimate as ranging between 2 percent for Czechoslovakia to about one-third for Bulgaria, Hungary and Romania, 69 percent for East Germany, and 148 percent for Poland. Soviet debt service as a share of total hard currency receipts was 17 percent in 1981.

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[17] From U.S. Treasury and Federal Reserve statistics.

[18] Statements of Active Loans and Financial Guarantees as of December 30, 1981, Export-Import Bank of the United States, Washington, D.C.

[19] In accordance with an October 1945 agreement, the U.S.S.R. made cumulative repayments on its lend-lease debt of $199 million in 1954-71. In 1972 the two countries agreed that the outstanding Soviet debt on lend lease would be fixed at $722 million and would be repaid over a 30-year period. However, after making payments of $60 million in 1972-74, the U.S.S.R.—in renouncing the 1972 Trade Agreement—made additional repayments contingent on renewed access to U.S. Export-Import Bank credits and most favored nation status.

[20] Bundesbank, Statistical Supplements, series 3, January 1982.

[21] The Bank of England Quarterly, March 1982.

TABLE 6.—U.S.S.R.: ESTIMATED MEASURES OF THE HARD CURRENCY DEBT BURDEN

[In millions of U.S. dollars]

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981 [1]
Merchandise exports	$2,954	$5,009	$7,869	$8,280	$10,225	$11,863	$13,336	$19,417	$23,584	$23,778
Total hard currency earnings [2]	4,300	8,600	11,900	11,700	14,900	18,400	21,500	26,500	30,900	32,600
Gross debt (yearend)	2,408	3,748	5,175	10,577	14,707	15,609	16,373	18,047	17,861	20,900
Principal payments [3]	306	397	625	969	1,366	1,955	2,332	2,800	3,051	3,200
Interest payments	170	332	508	804	1,012	1,140	1,219	1,430	1,620	2,200
Drawings [4]	906	1,737	2,052	6,371	5,495	2,857	3,096	4,474	2,865	6,300
Net transfer	430	1,008	919	4,598	3,117	−238	−455	244	−1,806	900
The ratio of debt service to merchandise exports (percent)	16	15	14	21	23	26	27	22	20	23
The ratio of debt service to total hard currency earnings (percent)	11	8	10	15	16	17	17	16	15	17
The ratio of gross outstanding debt to total hard currency earnings (percent)	56	44	43	90	99	85	76	68	58	64
The ratio of debt service to drawings (percent)	52	42	55	28	43	109	115	95	163	86
The ratio of short-term debt to total gross debt (percent)	NA	NA	NA	NA	NA	NA	19	18	22	29

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[1] Provisional.

[2] Hard currency earnings from merchandise exports, sales of gold and arms, invisibles, and transfers.

[3] On medium- and long-term debt.

[4] Gross drawings on medium- and long-term credits plus additions to short-term debt.

The maturity structure of the Soviet medium- and long-term debt is also fairly comfortable from the U.S.S.R.'s viewpoint. Estimates indicate that of total gross debt at yearend 1981, about two-fifths falls due in 1982-83. The weight of short-term debt has risen sharply, however, from about 20 percent of gross debt in 1978 to nearly 30 percent in 1981 because of heavy use of short-term grain credits. Although such a large short-term debt does not present an immediate problem for Moscow, it could do so if Western banks were to balk at requests to roll it over.

Two additional indicators reflect the impact of new borrowings and debt service payments upon a country's import capacity. The net transfer measure—new drawings less repayments of principal and interest—reflects the increase (or reduction) in a country's ability (or intention) to import goods and services as a result of borrowing. The U.S.S.R.'s heavy borrowing in 1975-76 produced an average net inward resource transfer of nearly $4 billion a year but carried with it the cost of rising debt service. Moscow's policy of slowing down new borrowings in 1977-80—coupled with the decision to prepay some of its Eurodollar syndications—practically eliminated the inward transfer in 1977-79 and resulted in an outward flow of about $1.8 billion in 1980. In 1981, the trend was reversed with a net inward transfer of about $900 million. We also calculate that portion of new drawings—86 percent in 1981—used to service existing debt in order to measure the extent to which Moscow is rolling over its debt.

V. OUTLOOK

The poor outlook for Soviet exports—especially as long as world oil prices remain soft—has compelled the U.S.S.R. to curb its hard currency imports. The U.S.S.R. could obtain some relief by tightening the screws on Eastern Europe; such a course, however, is fraught with hazards, especially given the economic problems already confronting Eastern Europe. In holding down—or cutting—imports, Moscow will face difficult decisions regarding the extent to which it should put the burden on the Soviet consumer rather than on investment and/or industry, which needs certain materials, such as steel and chemical feedstocks.

Paradoxically, even as domestic difficulties mount, Moscow's enthusiasm for expanding ties with the West may be cooling. Aversion to the rapid growth of hard currency debt in the mid-1970's led to a sharply slower growth in real imports—2 percent a year in 1977-81 compared with 19 percent a year in 1971-76—and restraints on new borrowing. Western trade sanctions following the Afghanistan invasion almost certainly dampened the enthusiasm of planners for relying on imports from the West, while the Polish crisis has reinforced the position of those opposing too much dependence on East-West trade. The cautious formulation of the foreign trade section in the plan for 1981-85 contrasts with the more bullish prospects outlined in previous five-year plan guidelines. In remarks to the Supreme Soviet in November 1981, State Planning Committee Chairman Baybakov stated that in the current five-year plan the U.S.S.R. would concentrate a greater share of its total trade volume on socialist countries. He implied that the volume of non-Communist country trade would grow only 2.3 percent a year during 1981–85. This compares with just over 5 percent a year in 1976–80 (4.9 percent a year in the case of hard currency trade). Presumably, given the Soviet penchant for trying to turn a deficit into a surplus, exports are to grow faster than imports, but this is not known definitely. In any case, the Soviet foreign trade plan appears to reflect Moscow's own concern over its export potential and its perception that import growth must be curbed.

The only new large source of additional hard currency earnings on the horizon is the new export gas pipeline, which will not be in full operation until the second half of the decade. Even then, earnings from the project probably will not offset an expected decline in oil earnings. The volume of oil exports probably will continue to fall, although perhaps not as drastically as some predict.[22] Oil prices, expected to remain soft at least for the next year or two, could at some point take off again, once more yielding the Soviets windfall profits. Commodity exports other than oil and gas, meanwhile, are expected to show little if any early growth. While some individual export items such as the platinum-group metals and diamonds will continue to be in demand in the West, most items in the U.S.S.R.'s export catalogue are products not well suited to Western markets or for which Western demand has weakened—notably, machinery, timber, nonplatinum-group metals, and chemicals. In light of the sluggishness forecast for the developed Western economies and in view of production problems in the U.S.S.R., export earnings are unlikely to rebound in the next few years. Although Moscow could step up gold sales, it would have to be careful not to push so much on the market that prices would be severely depressed.

The Soviets could go it alone if denied all access to Western imports, but only with sizable losses in consumer gains and in productivity, quality, and reliability. Hard currency imports are considerably more important to the U.S.S.R. than implied by the numbers. If Western technology and goods were scaled back, the U.S.S.R. could not adjust quickly or completely; valuable time would be lost, adding significant strains to an already stretched economy. Although imports from the West are equal to only 4 percent of the ruble value of Soviet GNP,[23] the proportional impact of a drop in trade would be substantially greater. Several major industrial development projects would be seriously delayed—if not abandoned—if imports were eliminated. Disruptions due to lost imports would not only hit those factories and sectors directly dependent on Western inputs but would spill over to other plants as well. Because the U.S.S.R.'s scarce stock of resources could not be stretched quickly to accommodate a sudden demand for import substitutes, the Soviet system would find it difficult to cope with a fall in trade with the West.

A similar analysis holds for Soviet agriculture. After three consecutive poor harvests—and another one likely this year—Moscow is in the position of having to import massive amounts of grain (perhaps exceeding the 1981 record) over the near future to boost per capita meat consumption and rebuild depleted stocks.[24] If Moscow bought no more grain, average meat production could be cut by about 2 million tons a year even if grain output returned to an average (trendline) level. Ultimately the per capita availability of meat and dairy products would decline.

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[22] See, for example, Ed A. Hewett, "Near-Term Prospects for the Soviet Natural Gas Industry and the Implications for East-West Trade" in this compendium.

[23] This figure was derived by dividing the ruble value of Soviet hard currency imports in 1980 by the CIA estimate of 1980 Soviet GNP in current rubles. A coefficient of 2.2 was used in converting the foreign exchange ruble value of imports into domestic rubles.

The U.S.S.R. could obtain some relief by scaling back its subsidized deliveries to Eastern Europe of goods marketable in the West.[25] As noted above, the Soviets already have notified some of their East Euorpean neighbors that they intend to cut shipments of crude oil originally scheduled for 1981-85 by about 10 percent. A diversion of this magnitude—about 90,000 b/d a year—to the Western market would add nearly $1 billion a year to Moscow's hard currency earnings. Cutbacks in deliveries of Soviet oil and other hard goods, however, would be a serious blow to the East Europeans, who are considerably more dependent on trade with the West than is the Soviet Union and could ill afford to buy goods on the world market or from the Soviets for hard currency.[26] Fear of growing unrest and reduced Soviet leverage in CEMA, moreover, are likely to cause the Soviets to move cautiously in trying to shift some of their exports from Eastern Europe to the West.

In the final analysis, Moscow probably will continue to muddle through by moving among these options as its perception of the most potentially troublesome areas changes. The Soviets will try at a minimum to import the machinery and technology necessary for investment in key sectors—notably energy—and sufficient industrial inputs to prevent serious bottlenecks in production while at the same time purchasing enough Western grain and other agricultural goods to maintain consumption near present levels and providing sufficient assistance to Eastern Europe to prevent popular unrest. Such a course of action could be carried out at a reduced level of imports but would involve further cuts in imports of non-energy related Western technology and equipment. Although this might fit with the U.S.S.R.'s reduced emphasis on capital investment, it would hurt Soviet chances for gains in productivity. Moscow, however, probably could keep its debt quite manageable provided that the decline in oil exports is not too precipitous, natural gas exports can be boosted substantially, and there are several consecutive years of average or better harvests.

There is nothing much the Soviets can do to prevent drops in oil available for export. They are now pressing construction of the new Siberia-to-Western Europe gas pipeline and probably will renew attempts to build a second line if they feel Western demand warrants it. There is also little Moscow can do in the short run to improve chances for overcoming the impact of bad weather on agricultural output. Brezhnev's new food program could turn into an administrative nightmare, and in any case probably will not yield any results soon.

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[24] This estimate is based on the methodology discussed in USSR: Long-Term Outlook for Grain Imports, ER79-10057, National Foreign Assessment Center, January 1979.

[25] Most Soviet deliveries of oil to Eastern Europe, for example, are tied to a formula which prices Soviet oil to the average world market price of the previous five years. In 1981, the East Europeans paid about $17 a barrel for Soviet crude compared with $34 a barrel for OPEC crude.

[26] For a discussion of East European energy and growth problems, see Robin A. Watson, "The Linkage between Energy and Growth Prospects in Eastern Europe," East European Economic Assessment, Part 2—Regional Assessments, Joint Economic Committee of the United States, Washington, D.C., July 10, 1981.

Therefore, if the Soviets wish to substantially boost their imports of capital equipment, they will have to accept a sharp rise in the debt service burden. It is likely, however, that if the present serious East-West strains continue, Western lenders will not be willing to provide substantial increases in their exposures vis-a-vis the U.S.S.R. In fact, Western commercial banks even now may be reluctant to do much more than roll over the U.S.S.R.'s debt and are highly unlikely to provide any general purpose loans should Moscow seek them.

APPENDIX A

U.S.S.R.: MULTILATERAL TRADE PARTNERS, 1970–81 [1]

[As reported by partner countries to the IMF]

EC:
- Belgium
- Denmark
- Federal Republic of Germany
- France
- Greece (1978 on)
- Ireland
- Italy
- Luxembourg
- Netherlands
- United Kingdom

Other Europe:
- Austria (1971 on)
- Iceland (1977 on)
- Malta
- Norway
- Portugal
- Spain
- Sweden
- Switzerland

Africa:
- Algeria (1980 on)
- Angola (1977 on)
- Benin
- Burundi
- Cameroon
- Cape Verde Islands (1978 on)
- Central African Republic
- Congo
- Equatorial Guinea
- Gabon
- Gambia
- Ghana (1976 on)
- Guinea Bissau
- Ivory Coast
- Kenya
- Liberia
- Libyan Arab Republic
- Malagasy Republic
- Malawi
- Mali (1978 on)
- Mauritania
- Mauritius
- Mozambique
- Niger
- Nigeria
- Rwanda
- Senegal
- Sierra Leone
- Sudan
- Tanzania
- Togo
- Tunisia
- Uganda
- Upper Volta
- Zaire
- Zambia

Latin America:
- Argentina
- Bolivia
- Brazil
- Chile
- Colombia
- Costa Rica
- Dominican Republic
- Ecuador
- El Salvador
- Guatemala
- Guyana
- Jamaica
- Honduras
- Mexico
- Nicaragua
- Panama
- Paraguay
- Peru
- Trinidad and Tobago
- Uruguay
- Venezuela

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[1] We have used data on Soviet trade with the multilateral trade partners in calculating hard currency trade with non-Communist countries. Some of the Soviet trade with the multilateral LDC partners, however, probably is on a barter basis. Conversely, part of the trade with bilateral LDC partners may be on a hard currency settlement basis.

Asia and Middle-East:
Burma
Cyprus
Indonesia
Iraq
Israel
Hong Kong
Jordan
Kuwait
Lebanon
Macao
Malasysia
Nepal (through 1976)
Philippines
Saudia Arabia
Singapore
Sri Lanka (1977 on)
Thailand
Yemen Arab Republic
Yemen People's Republic

APPENDIX B

U.S.S.R.: HARD CURRENCY IMPORTS [1]

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
	[In millions of current U.S. dollars] [2]											
Total	2,984	3,093	4,342	6,744	8,695	14,577	15,478	14,805	17,026	21.435	26,070	27,778
Grain	101	185	770	1,423	635	2,323	2,627	1,356	2,353	3,279	4,360	6,217
Other agricultural products	657	600	543	1,118	1,388	1,760	1,665	2,005	1,721	2,854	4,400	5,104
Machinery and equipment [3]	967	960	1,283	1,739	2,334	4,593	5,074	5,117	5,970	6,032	6,039	4,523
Ferrous metals	303	374	498	899	1,942	2,627	2,296	1,819	2,588	3,536	3,606	3,597
Chemicals	215	206	249	270	707	722	609	658	815	1,190	1,545	1,590
Other [4]	741	768	999	1,295	1,689	2,552	3,207	3,850	3,579	4,544	6,120	6,747
	[In millions of 1970 U.S. dollars] [5]											
Total	2,984	2,851	3,677	4,349	5,223	7,419	8,325	7,531	7,294	8,324	9,188	9,205
Grain	101	185	726	783	245	997	1,257	671	934	1,100	1,188	1,600
Other agricultural products	657	611	383	406	671	862	816	709	548	945	1,419	1,660
Machinery and equipment [3]	967	946	1,150	1,353	1,622	2,700	2,929	2,829	2,716	2,513	2,350	1,675
Ferrous metals	303	220	327	593	1,095	1,055	1,170	945	1,151	1,474	1,383	1,300
Chemicals	215	204	245	233	501	448	363	302	340	430	573	575
Other	741	685	846	981	1,089	1,357	1,790	2,075	1,605	1,862	2,275	2,395

[1] Includes all countries trading with the Soviet Union on a hard currency basis as of Jan. 1, 1981.

[2] Source: Official Soviet foreign trade statistics.

[3] Includes the following imports which the U.S.S.R. reported in footnotes and which we believe are associated with the Orenburg natural gas pipeline: $420 million in 1976, $888 million in 1977, $286 million in 1978, $30 million in 1979, $18 million in 1980 and zero in 1981.

[4] Excluding imports associated with the Orenburg pipeline.

[5] The constant price series was estimated by using actual quantity data where available (for example, for wheat and corn) or by deflating the value series by U.N. and other Western price indices for various commodity group.

APPENDIX C

U.S.S.R. HARD CURRENCY EXPORTS [1]

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981 [2]
	[In millions of current U.S. dollars] [3]											
Total	2,424	2,776	2,954	5,009	7,869	8,280	10,225	11,863	13,336	19,417	23,584	23,778
Petroleum	430	608	600	1,304	2,741	3,391	4,748	5,583	5,710	9,585	11,995	12,287
Natural gas	14	21	24	32	95	220	358	566	1,072	1,404	2,704	3,968
Coal and coke	106	127	124	139	256	402	377	366	295	315	366	179
Machinery and equipment	193	207	267	360	398	647	803	905	1,299	1,574	1,466	1,534
Ferrous metals	137	131	130	216	236	164	171	181	129	216	246	169
Wood and wood products	389	379	421	747	1,046	739	889	1,084	991	1,370	1,500	1,016
Chemicals	64	65	70	110	246	243	198	215	287	542	746	770
Agricultural products	192	340	360	367	677	547	553	652	447	457	454	690
Diamonds [4]	175	257	371	515	545	478	511	606	773	1,043	1,304	3,555
Other	724	642	587	1,219	1,629	1,449	1,617	1,705	2,333	2,911	2,803	
	[In millions of 1970 U.S. dollars] [5]											
Total	2,424	2,589	2,541	2,939	2,910	2,946	3,342	3,359	4,075	4,018	3,747	3,469
Petroleum	430	490	443	512	430	555	671	731	791	636	619	582
Natural gas	14	14	28	28	70	98	168	196	238	294	294	322
Coal and coke	106	81	80	85	93	88	91	90	70	65	59	25
Machinery and equipment	193	172	201	235	232	320	390	360	562	628	535	560
Ferrous metals	137	167	172	182	99	82	109	143	93	102	110	105
Wood and wood products	389	380	420	466	401	375	468	443	415	384	333	200
Chemicals	64	69	91	106	177	151	119	134	188	316	393	385
Agricultural products	192	330	227	153	249	252	200	229	144	111	106	160
Diamonds	175	252	346	359	315	282	284	291	376	380	376	1,130
Other	724	634	533	813	844	743	842	742	1,198	1,102	922	

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[1] Includes all countries trading with the Soviet Union on a hard currency basis as of Jan. 1, 1981.

[2] Estimated.

[3] Source: Official Soviet foreign trade statistics.

[4] Source: OECD statistics.

[5] The constant price series was estimated by using actual quantity data where available (for example, for oil and natural gas) or by deflating the value series by U.N. and other Western price indices for various commodity groups.

APPENDIX D

U.S.S.R.: PERCENTAGE SHARE OF HARD CURRENCY TRADE IN TOTAL TRADE BY CATEGORY [1]

	Exports			Imports		
	1970	1975	1980	1970	1975	1980
Total	17	23	31	23	38	38
Fuels	24	36	42	4	34	NA
Crude oil and petroleum products	25	40	43	10	72	NA
Natural gas	2	34	48	0	0	NA
Machinery and equipment	5	9	3	22	37	26
Ferrous metals	10	6	7	47	77	75
Chemicals	18	25	36	34	42	42
Wood and wood products	44	37	48	34	27	15
Agricultural products	14	24	25	27	42	66
Grain	5	1	0	73	87	90
Consumer goods	23	26	13	12	9	9

[1] The importance of hard currency trade in total trade is overstated in Soviet statistics because of the favorable prices the U.S.S.R. extends to the CEMA countries for exports and imports.

Source: Official Soviet foreign trade statistics.

APPENDIX E

U.S.S.R.: EXPORTS OF PETROLEUM AND NATURAL GAS FOR HARD CURRENCY [1]

	Petroleum and petroleum products		Natural gas	
	Thousand barrels/day [2]	Millions of U.S. dollars [3]	Million cubic feet/day [2]	Millions of U.S. dollars
1970	620	387	100	12
1971	706	567	100	20
1972	653	556	200	23
1973	702	1,248	200	23
1974	601	2,564	500	86
1975	764	3,176	700	220
1976	944	4,514	1,200	347
1977	1,050	5,293	1,400	566
1978	1,100	5,710	1,700	1,063
1979	1,000	9,582	2,100	1,404
1980	973	12,028	2,100	2,706
1981	920	12,287	2,300	3,956

[1] Excluding hard currency exports to other Communist countries.

[2] From official Soviet foreign trade statistics through 1976 and estimated thereafter.

[3] Based on official Soviet foreign trade statistics with an estimate for deliveries to those hard currency LDC's for which Soviet exports of oil are not reported.

APPENDIX F

U.S.S.R.: ESTIMATED MILITARY DELIVERIES TO LDC's

[In millions of U.S. dollars]

	Total	Of which, for hard currency [1]
1970	775	400
1971	680	400
1972	960	600
1973	2,190	1,600
1974	1,980	1,500
1975	1,860	1,500
1976	2,270	1,850

APPENDIX F—CONTINUED

[In millions of U.S. dollars]

	Total	Of which, for hard currency
1977	3,810	3,220
1978	4,130	3,965
1979	4,270	3,855
1980	4,670	4,200
1981	4,960	4,200

APPENDIX G

U.S.S.R.: ANNUAL GOLD SALES

	Metric tons [1]	In millions of U.S. dollars [2]
1970	3	Negligible
1971	19	24
1972	158	289
1973	304	962
1974	131	683
1975	147	725
1976	328	1,369
1977	332	1,618
1978	401	2,522
1979	220	1,490
1980	80	1,580
1981	[3] 200	2,700

[1] Source: "Annual Bullion Review," 1971-80, Samm & Co., Ltd., London.

[2] Dollar values calculated by applying estimated average London gold price for the year in question.

[3] The 1981 Annual Bullion Review estimates Soviet gold sales in that year at 280 tons. Other sources indicate the number was closer to 200 tons. See, for example, "East European Soviet Hard-Currency Trade and Debt in 1981," Wharton Econometric Forecasting Associates, Dec. 7, 1981.

APPENDIX H

ESTIMATING SOVIET HARD CURRENCY DEBT [1]

Because the U.S.S.R. does not release information regarding its financial position vis-a-vis the West, estimates of Soviet indebtedness must rely on Western financial reporting. Such reporting, however, continues to be seriously deficient in both scope and quality of coverage. This paucity of data has necessitated numerous, and sometimes tenuous, assumptions in calculating the structure and size of Soviet debt to the West.

Commercial debt

We use as the basis of our estimates of Soviet commercial debt reporting by the Bank for International Settlements (BIS) on the asset and liability positions of Western commercial banks vis-a-vis the U.S.S.R. The BIS series is adjusted to account for: (1) reported bank lending supported by official credit guarantees; (2) Swiss and Japanese bank positions reported to the BIS but not broken out with respect to the U.S.S.R. until 1978; (3) Austrian bank positions not reported to the BIS until 1977; (4) net Soviet borrowing from outside the BIS reporting area; (5) Soviet promissory notes held in the West but not included in BIS reporting; and (6) net borrowing by CEMA's international banks, which Western banks include in their position vis-a-vis the U.S.S.R.

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[1] See also, Paul G. Ericson and Ronald S. Miller, "Soviet Foreign Economic Behavior: A Balance of Payments Perspective," Soviet Economy in a Time of Change, Vol. 2, Joint Economic Committee, Congress of the United States, Washington, D.C., October 10, 1979.

From available data on officially backed export credits, we have attempted to estimate that portion of bank lending that also is counted under our estimates of officially supported debt. Since we lack authoritative information on the amount of double counting, our estimates are subject to a wide range of error. For example, in 1981 we allowed for $740 million in double counting in estimating the U.S.S.R.'s debt. We believe that the actual total probably ranged between $500 million and $1 billion.

Western Government-backed debt

The estimate of that portion of Soviet debt backed by offical Western credit guarantees is based on an analysis of unpublished data. From various statistical sources, we have derived new commitments of guaranteed credits, drawings on these credits, outstanding undrawn commitments, outstanding debt, and total exposure. Since we must make a number of simplifying assumptions in computing these totals, we ascribe a 10-percent range of error to our estimates. Debt estimates for yearend 1980 and 1981 are largely extrapolations of past trends.

The information on commitments apparently refers, in part, to offers of Western credit for specific projects. The estimate of Soviet exposure—as measured by total commitments reported by the West—is inflated to the extent that Western commitments have not been matched by Soviet orders for Western equipment, pipe, or other products that have yet to be delivered.

In the case of borrowing by CEMA's interntional banks, Western banks include their positions vis-a-vis IBEC and IIB in their position with the U.S.S.R. Using published Interntional Bank for Economic Cooperation (IBEC) and International Investment Bank (IIB) balance sheets we attempt to estimate that portion of Western bank net assets with the U.S.S.R. that actually represents lending to the two international banks.[2] We subtract these amounts from reported Western bank claims against the U.S.S.R. to derive the position against the U.S.S.R. alone.

As far as double counting is concerned, apparently neither the BIS nor those familiar with Western bank reporting procedures can identify that portion of assets that member banks report to the BIS which are backed by government credit guarantees. Reporting procedures and conventions appear to vary by country. We have assumed that officially supported credits have not constituted a sizable share of Western bank claims on the U.S.S.R. There are indications that a portion of officially supported credits held by French and Japanese banks is reported to the BIS, as are all officially supported nonsterling credits held by British banks and all officially guaranteed U.S. credits. To date, the amount of United Kingdom loans not denominated in pounds sterling has been minimal, and U.S. banks have not requested official credit guarantees on their loans to the U.S.S.R.

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[2] The latest published balance sheets for IBEC and IIB appear in "Deyatel 'nost' MIB v 1981 godu," Ekonomicheskaya gazeta, No. 20, May 1982, p. 20 and "Deyatel 'nost' MBE C v 1981 godu" Ekonomicheskaya gazeta, No. 22, May 1982, p. 19.

APPENDIX I

U.S.S.R.: EQUIPMENT ORDERS PLACED WITH MULTILATERAL TRADING PARTNERS[1]

[In Millions of U.S. dollars]

	Total	Of which: Equipment for oil and natural gas projects
1970	500	
1971	850	
1972	1,700	325
1973	2,600	200
1974	4,300	600
1975	4,650	525
1976[2]	6,000	1,700
1977	3,800	300
1978	2,800	825
1979	2,675	200
1980	2,600	400
1981[3]	6,700	3,800

[1] Data on Soviet orders are collected from a variety of sources including trade journals and Western newspapers.

[2] The value for 1976 includes roughly $1,000,000,000 in orders for the Orenburg pipeline project.

[3] The value for 1981 includes about $4,000,000,000 in orders for the gas export pipeline projects. Some of this—such as pipelayers—is included under a category other than oil and natural gas equipment.

AN ECONOMIC MODEL OF UNITED STATES AND WESTERN CONTROLS ON EXPORTS TO THE SOVIET UNION AND EASTERN EUROPE

By Thomas O. Bayard, Joseph Pelzman, and
Jorge F. Perez-Lopez* **

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I. INTRODUCTION

The purpose of this paper is to outline a model and present some preliminary simulations of the economic implications of export controls. A model based on the theory of economic cartels is developed and applied to actual 1976 trade data to simulate the economic impact of hypothetical restrictions on U.S. and other Western exports of goods to the Soviet Union and Eastern European members of the Council for Mutual Economic Assistance (CMEA).[1] The approach abstracts both from the broader political implications of export controls and from the economic effects of current controls

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**The views expressed in this paper are the authors' and do not reflect those of the U.S. Department of Labor.

[1] Eastern Europe refers to Bulgaria, Czechoslovakia, East Germany, Hungary, Poland and Romania. As used in this paper, CMEA refers to the six East European nations and the Soviet Union.

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on East-West trade. Therefore, it should not be used to infer the effectiveness of past, current or proposed controls.

Export controls, or the threat of export controls, can be used for a variety of foreign policy and strategic reasons. On one level, they may serve to send a symbolic message of displeasure with other nations' behavior. On another level, they may be intended to induce a change in the targeted countries' behavior by imposing economic costs on them. On yet a third level, controls may seek to reduce or slow the development of an adversary's military or strategic capabilities by inflicting economic damage.

Regardless of the specific objective of controls, assessments of the actual or potential economic costs incurred by each party are important for policymakers in both exporting and targeted importing countries. Two closely related questions are involved in such an assessment: 1) is it potentially feasible to impose economic costs on the targeted country (or countries) by instituting either unilateral or multilateral export controls?; and 2) what are the costs imposed by the controls on both the importing and exporting countries?

The economic framework developed in this paper examines the conditions under which it may be feasible for the U.S. alone or in combination with other Western nations to inflict economic costs on the Soviet Union and Eastern Europe through export controls and develops a methodology for assessing the costs incurred by both targeted and exporting countries. Since the economic effectiveness of export controls depends on the oligopoly power (i.e., the ability to restrict exports and raise prices) wielded by participating exporters, the analysis is based on cartel theory. Simulations with the methodology and several export control scenarios illustrate the potential usefulness of this approach.

The model is based on the notion that it may be feasible to use export controls to inflict economic damage on targeted importers if their demand for controlled goods is relatively unresponsive to price changes. For goods characterized by inelastic demand, the economic costs of controls will tend to be higher for targeted importers than for exporters. The demand for controlled imports depends on the demand for imports regardless of source, the substitution possibilities between controlled and uncontrolled goods, the availability of alternative supplies and the share of total trade controlled by participating exporters.

The feasibility of controls depends on these factors, on the countries participating in the control of exports and on the costs of building, policing and enforcing an effective coalition of exporters. Alternative scenarios are developed in which these factors are allowed to vary in order to examine the conditions under which controls can be used to inflict relatively high economic costs on importers while minimizing the costs to exporters.

There are several significant limitations to a model which focuses narrowly on the economic costs and benefits of commodity export controls. The most important one is that, because it is not designed to deal with the political and strategic objectives of controls, it can not be used to evaluate their ultimate efficacy, that is, the extent to which the controls induce changes in other nations' behavior or safeguard the national security. To be useful in an analysis of the effectiveness of export controls, the economic model presented here must be integrated into a comprehensive framework which includes diplomatic, political and strategic considerations. A second limitation of our framework is that it deals only with one aspect of the broader question of economic sanctions—controls on commodity exports. Data limitations preclude consideration here of controls on imports of know-how and on the availability of credits. The fact that the methodology is highly quantitative and requires accurate parameter estimates and detailed trade data may limit the usefulness of the approach in certain cases.

The paper is organized as follows. Section II differentiates among policy objectives, instruments and constraints of export controls and briefly reviews the U.S. legal and institutional framework for unilateral and multilateral export controls. Section III lays out the economic model and discusses its applicability to the East-West export controls question. Section IV presents simulation results within the East-West trade framework as well as a discussion of the limitations of the data and parameter estimates.

II. EXPORT CONTROLS: POLICY OBJECTIVES, INSTRUMENTS, CONSTRAINTS

The popular literature on East-West export controls reveals considerable confusion about the purposes of export controls, the means through which those ends are to be accomplished and the political, economic and diplomatic climate in which they are implemented. This confusion results primarily from the lack of clear definition and differentiation between the policy objectives of export controls, the policy instruments through which controls are implemented and political and economic constraints on the use of controls.

The policy objectives of current U.S. controls on exports of goods and technology [2] are set forth in the Declaration of Policy section (Section 3) of the Export Administration Act of 1979: 1. To safeguard the national security of the United States; 2. To further significantly the foreign policy of the United States; and 3. To protect the domestic economy from the excessive drain of scarce material and to reduce the serious inflationary impact of foreign demand.

In the context of East-West trade, national security and foreign policy considerations predominate and, therefore, this paper focuses strictly on them.

The policy instrument specified in the EAA of 1979 by which these objectives are to be attained is the restriction or control of exports of goods and technology. The mechanism through which export controls operate is either by preventing (or at least delaying) growth in the production possibilities of the target country or by increasing economic costs. For example, national security export controls seek to prevent the enhancement of an adversary's military or strategic capabilities by withholding a scarce resource, while foreign policy controls send a symbolic message of displeasure with another nation's foreign or domestic behavior, or seek to induce a change in such behavior, by increasing economic costs to the target country. It is important to emphasize that the restriction of goods and technology exports per se is not the policy aim. Regardless of how effective a system of controls might be in restricting exports, the objectives of the EAA of 1979 would not be accomplished so long as the restrictions do not have the effect of safeguarding national security or furthering foreign policy.

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[2] Certain U.S. statutory restrictions on exports which apply to specific commodities to all destinations are not the subject of this study. For example, U.S. exports of nuclear materials, hardware and technology to all destinations are controlled by the Atomic Energy Act of 1954 (as amended) and the Nuclear Non-Proliferation Act of 1978. Exports of hazardous products to all destinations are controlled by no less than 13 separate statutes, including the Consumer Product Safety Act, the Federal Hazardous Substances Act, the Flammable Fabrics Act, the Federal Insecticide, Fungicide and Rodenticide Act, the Toxic Substances Control Act, the Public Health Service Act, the Federal Food, Drug and Cosmetic Act, the Federal Meat Inspection Act and the Poultry Products Inspection Act. See the review of Executive Branch potential export desincentives contained in the Report of the President on Export Promotion Functions and Potential Export Disincentives (Washington: U.S. Government Printing Office, 1980), especially Chapter 7 and Appendix F.

Yet another important consideration in an analysis of export controls is the political and economic environment in which the export control decisions are made and export control policies implemented. These external considerations act as constraints on the selection as well as on the implementation and effectiveness of export controls. They are often of paramount importance in setting the parameters within which specific export controls policy decisions are made. In particular, the general economic climate in the U.S., the condition of overall U.S.-Soviet relations and the state of the larger controversy over the costs and benefits to the U.S. of East-West trade, have an important bearing on the controls system.

A. U.S. EXPORT CONTROLS AND THE EAST-WEST TRADE CONTROVERSY

Two major schools of thought exist in the U.S. Congress, the Executive Branch and the academic community with regard to the cost and benefits of East-West trade.[3] One school emphasizes the mutual benefits which accrue from East-West trade. Trade with the Soviet Union and its allies is seen as benefiting the West by opening up new and profitable markets and providing opportunities to increase production runs and reap economies of scale. The economic interdependence between the East and the West created by trade is seen as a stabilizing force in East-West relations which can bring political benefits. Thus, proponents of this school of thought favor facilitation of East-West trade through nondiscriminatory tariff treatment of imports from the Eastern countries, liberalization of export controls to cover only products of direct strategic significance, freer availability of credits, etc. This school believes that trade is ineffective as leverage for political purposes.

A competing conception of the costs and benefits of East-West trade is held by those who emphasize the adversarial nature of East-West relations. This group perceives East-West trade as benefiting the Soviet Union and its allies at the expense of the West. Exports from the West bail out the inefficient Communist economies and give them the latitude to destabilize democratic regimes around the world. Transfers of technology directly enhance Communist military capability and force the United States to continue to spend heavily on military R&D to maintain the strategic balance. Economic benefits to Western firms from East-West trade are, in the aggregate, negligible and offset by gains for the Eastern nations. While stopping short of advocating a complete ban on trade with the Soviet Union and its allies, proponents of this school would deny them high technology exports and would extract maximum short term economic and political benefits from trade.

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[3] For discussion on the two schools of thought on the costs and benefits of East-West trade see Bresnick (1979), pp. 3-4.

The two schools of thought on East-West trade define two extremes between which U.S. export controls fluctuate. At any given point in time, depending on the political climate of East-West relations, the U.S. export controls system may cast a wider or narrower net, the interests of exporters may receive more or less consideration and efforts to bring U.S. unilateral controls in line with multilateral standards may intensify or wane.

B. DEVELOPMENT OF U.S. CONTROLS ON EAST-WEST TRADE

The evolution of the system of U.S. controls on exports to the Soviet Union and Eastern Europe illustrates the long-term debate over the proper trade policy vis-a-vis these nations and over the efficacy of unilateral controls in reaching foreign policy or national security objectives.

Prior to World War II, the President's authority to restrict exports was limited to times of war or emergency under provisions of the Trading with the Enemy Act of 1917. Shortly after World War II ended, the United States was faced with world-wide shortages of some key commodities, the need to channel certain products on a priority basis to particular European countries to aid in their economic reconstruction, and incipient concerns about shipping materials of potential military significance to the Soviet Union and its allies. In response, the Congress passed the Export Control Act of 1949 granting the President, for the first time, the power to restrict exports in the absence of war or emergency.[4] Under the Act, the President was granted broad powers to limit U.S. exports to one or more destinations based on foreign policy and national security reasons. Although the Act was envisioned as a temporary instrument, it was renewed in 1951 during the Korean War and again in 1953, 1956, 1958, 1960, 1962 and 1965.

Another statute which had an important impact on U.S. East-West trade controls was the Mutual Defense Assistance Act of 1951 (commonly known as the Battle Act). Although it did not control U.S. exports directly, the Battle Act: 1) established that it was U.S. policy to embargo shipments of arms and other strategic items to any nation or group of nations (including the Soviet Union and its allies) threatening U.S. security; 2) provided authority to cut off military, economic and financial assistance to any nation which knowingly permitted such exports; and 3) supplied the institutional framework for U.S. participation in multilateral groups designed to coordinate Western nations' trade restrictions against Communist countries.

At about the same time that the Congress was considering the Export Control Act of 1949, the United States and six European allies (the United Kingdom, France, Italy, Belgium, Luxembourg and the Netherlands) established a multilateral system of controls on exports to the "Sino-Soviet bloc."[5] A Consultative Group (CG) of officials from each of the participating countries was formally created in 1949 and charged with developing policy on export controls. Administration of the multilateral controls system and preparation of lists of products to be controlled was entrusted to a Coordinating Committee (COCOM), concerned with trade with the Soviet Union and Eastern Europe, and a China Committee (CHINCOM), regulating exports to the People's Republic of China and North Korea. In 1957 export restrictions to both sets of nations were brought into conformity and CHINCOM was phased out, with COCOM assuming responsibility for regulating exports to the People's Republic of China and North Korea. Over the years COCOM has also taken over the policy role of the CG so that in effect it is responsible for all aspects of the multilateral export controls system. Membership in COCOM has expanded to include Norway, Denmark, Canada, West Germany, Greece, Portugal, Turkey and Japan, that is, the NATO countries, less Iceland, plus Japan.

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[4] For background on the Export Control Act of 1949 see Berman and Garson (1967) and Metzger (1964).

In the late 1960s the U.S. export control system underwent significant changes. Following the lead of Western Europe and Japan, the United States undertook a major reevaluation of its export controls policies seeking a more adequate balance between national security and economic interests. The review of controls culminated in the passage of the Export Administration Act of 1969 (EAA of 1969), the first major revamping of the U.S. export controls system since the Export Control Act of 1949. Passage of the EAA of 1969 and its successor, the Export Administration Act of 1979 (EAA of 1979), reflected Congressional desire to limit controls to strategic goods and technologies, recognize the impact of controls decisions on the exporting community and increase policy coordination with COCOM members.

Strategic v. economic significance.—As a wartime measure, the controls on U.S. exports authorized by the Trading With the Enemy Act of 1917 were sweeping. The Act banned all trade, except by Presidential license, with enemy countries in order to disrupt their war efforts and deny them hard currency. The restrictions covered all exports and imports of goods and services to all enemy countries for an unlimited period of time.

In the Export Control Act of 1949, the Congress found that "the unrestricted export of materials without regard for their potential military significance may affect the national security" and declared it to be U.S. policy to "exercise the necessary vigilance over exports from the standpoint of their significance to national security." The President was granted authority to control exports of "any articles, materials or supplies, including technical data" whenever such exports were detrimental to the national security. Although the statute did not further define the nature of the items which should be controlled for national security purposes, it appears that it was broadly interpreted. Thus, the legislative history of the Act included a statement from the Department of Commerce indicating that "shipments of industrial materials which may have direct or indirect military significance" would be scrutinized.[6] Further, a Senate report on a 1953 bill extending the Act listed some of the goods of "strategic significance" which should be denied the Soviet Union and its allies: electronics equipment, aviation gasoline, aluminum, advanced types of machine tools.[7]

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[5] The historical development of international export control groups given here relies heavily on U.S. Congress, Office of Technology Assessment (1979), Chapter VIII.

In the 1962 bill extending the Act until June 30, 1965, the Congress formally broadened the scope of the controls by finding that the national security could be affected not only by exports of materials of military importance, but also by those of economic significance. This finding reflected widespread sentiment in the Congress that exports of nonmilitary items which assisted the economic development of the Soviet Union and its allies could, in the long run, have an adverse impact on the national security of the United States. Thus, the Congress authorized the control of any exports the President deemed to make a significant contribution to the military or economic potential of a nation or nations which would prove detrimental to the U.S. national security and welfare. The Senate report on the extension bill noted that the Act gave the President—

> The widest possible discretion . . . [to control] exports . . . of any or all commodities or articles whether or not, and to whatever extent they are of military, industrial, or economic significance, if . . . [such controls are] . . . found to be in the interest of our national security or our foreign policy or necessary because of domestic shortages. The Act is not limited to strategic materials or to critical material or to essential commodities.[8]

Despite the Congressional resolve for very broad controls on exports to the Soviet Union and its allies indicated in the 1962 amendments to the Act, by the end of the 1960s the "don't sell them anything" policy was overtaken by a policy of endorsement of trade in peaceful goods. In the EAA of 1969, the Congress modified the economic denial policy which de facto had been in effect for twenty years and set forth that it was the policy of the United States to safeguard the national security by controlling "the export of goods and technology which would make a significant contribution to the military potential of any other nation or nations." The EAA of 1979 continued the policy of strategic embargo and set up special provisions under which controls could be instituted for foreign policy reasons.

Export promotion.—The Trading with the Enemy Act of 1917 and the Export Control Act of 1949 made no reference to the impact of controls on the domestic economy and did not provide a mechanism for exporters to register their views on export controls. It is fair to say that the Export Control Act of 1949 and the seven bills which extended it through 1969 "operated under the presumption that exports were a privilege and not a right." [9]

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[6] Senate Report No. 31, February 4, 1949, to accompany S. 548. As reported in U.S. Code Congressional Service, 81st Congress, First Session, 1949 (Minneapolis: West Publishing Company, 1949), p. 1096.

[7] Senate Report No. 207, April 30, 1953, to accompany S. 1739. As reported in U.S. Code Congressional and Administrative News, 83rd Congress, First Session, 1953 (Minneapolis: West Publishing Company, 1953), p. 1688.

[8] Senate Report No. 1576, June 7, 1962, to accompany S. 3161. As reported in U.S. Code Congressional and Administrative News, 87th Congress, Second Session, 1962 (Minneapolis: West Publishing Company, 1962), p. 1817.

[9] Bertsch (1981), p. 68.

Beginning in the mid-1950s, the Soviet Union and Eastern European nations entered into a growing number of bilateral trade and payments agreements with Western European nations and began to place orders for capital goods.[10] This Soviet and Eastern European opening to imports from the West coincided with a period of increased availability of foreign exchange resulting from sales of raw materials, primarily oil, in Western markets. Businessmen in Western Europe quickly moved to take advantage of the possibility of new markets for their products and began to pressure their governments to relax COCOM controls. The United States reluctantly agreed in 1954 to a one-third reduction in the number of items in the COCOM lists, but chose to maintain unilateral controls on most of them. In the 1960s, aided by medium- and long-term credits to finance Soviet and Eastern European purchases of industrial products, subsidies for grain exports and MFN tariff treatment of imports from Eastern countries, Western European and Japanese businessmen increased their trade with these countries while U.S. businessmen were prohibited from doing so by more restrictive U.S. policies. The perception that Western European and Japanese businessmen were reaping the benefits of East-West trade, coupled with the lack of success of controls in modifying the Communist regimes, brought about major Congressional review of the economic costs and benefits of export controls.

In the EAA of 1969, the Congress for the first time recognized the impact of export controls on the U.S. economy. The Congress found that "the unwarranted restriction of exports from the United States has a serious adverse effect on our balance of payments," and sought to promote exports to the East without jeopardizing national security. In balancing the economic benefits which would accrue from East-West trade with the preservation of national security, the Act established two potentially conflicting policy objectives.

> (A) to encourage trade with all countries with which we have diplomatic or trading relations, except those countries with which such trade has been determined by the President to be against the national interest, and (B) to restrict the export of goods and technology which would make a significant contribution to the military potential of any other nation or nations which would prove detrimental to the national security of the United States.

In order to increase the private sector's input into the implementation of export controls, the EAA of 1969 provided for the establishment of a series of Technical Advisory Committees (TACs) for industries affected by export controls. The TACs would advise the Secretary of Commerce on technical matters related to the products or technology in their area of expertise, on worldwide availability and actual utilization of production technologies, on licensing procedures which affect the level of export controls applicable to products or technology, and on revisions of the list of items under U.S. unilateral or multilateral controls.

In the EAA of 1979 the Congress went beyond the EAA of 1969 in recognizing the importance of exports to the U.S. economy. The Congress found that "exports contribute significantly to the balance of trade, employment and production of the U.S." and that

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[10] This section draws heavily on U.S. Department of Commerce (1975), pp. A2–A6.

"the ability of U.S. citizens to engage in international commerce is a fundamental concern of U.S. policy." Among the objectives of the Act, the Congress listed the following: 1) reduce uncertainties in export controls policy in order to encourage exports to all countries with which the United States has diplomatic or trading relations; 2) restrict the ability to export only after full consideration of the impact on the U.S. economy; 3) administer controls consistent with basic standards of due process; and 4) encourage multilateral cooperation in the use of controls. Thus, while it did not establish a "right to export" in a constitutional or other legally-enforceable way, recognition by the Congress in the EAA of 1979 that the "ability" of U.S. citizens to trade is a "fundamental concern of U.S. policy" negated the concept of "exports as a privilege" embodied in the export controls legislation during 1949–1969.[11]

International cooperation.— In its formative years, COCOM and the other international export control groups were heavily influenced by the United States. Two factors were primarily responsible for this: first, because their industrial base had suffered heavily during World War II, the Western European economies were unable to produce strategic goods for export to the East, leaving the United States as the only source of many such products; and second, economic assistance under the Marshall Plan gave the United States considerable leverage over the allies. By the mid-1950s the Western European nations and Japan were well along the path of economic recovery, U.S. occupation forces had returned home and the Marshall plan was being phased out. As noted earlier, in 1954 some Western European nations were already established as suppliers to Eastern countries and, at their insistence, the COCOM list of forbidden exports was trimmed significantly. Despite these developments, the United States maintained a restrictive controls policy and, in effect, controlled exports of many of the products which had been removed from multilateral controls.

Congress first explicitly called for increased international cooperation on export controls in the 1962 amendments to the Export Control Act of 1962. Recognizing that the less restrictive export controls policies of Western Europe and Japan were frustrating U.S. controls, the Congress declared it to be U.S. policy—

> . . . to formulate, reformulate, and apply such controls to the maximum extent possible in cooperation with all nations with which the United States has defense treaty commitments, and to formulate a unified commercial and trading policy to be observed by the non-Communist-dominated nations or areas in their dealings with the Communist-dominated nations.

This amendment did not mean that the United States would lower its controls standards to Western European levels, but rather that the allies would be induced to bring their controls standards to match those of the United States.[12] As this attempt was unsuccessful, the Congress in the EAA of 1969 came to terms with the futility of a "going at it alone" export controls policy and recognized the adverse economic effect of controls "particularly when export restrictions applied by the United States are more extensive than export restrictions imposed by countries with which the United States has defense treaty commitments." The EAA of 1969 declared it to be U.S. policy to develop export controls in cooperation with all nations with which the United States had treaty commitments and to formulate a unified multilateral trade control policy to be observed by all nations. The EAA of 1979 continued the emphasis on reducing to a minimum unilateral controls and introduced the concept of a foreign availability determination in the process of establishing national security controls.

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[11] In effect, a bill introduced by Senator Stevenson during the Congressional deliberations on the EAA of 1979 would have substituted "right" for "ability" in the policy statement. For discussion on this point see U.S. Congress, Office of Technology Assessment (1979), p. 124 and Elliott (1981). See also Bingham and Johnson (1979).

[12] This point is discussed in Berman and Garson (1967), pp. 801–2.

Although currently the United States maintains unilateral controls on a larger set of products and technologies than appear in the COCOM lists, there has been a fundamental change in the earlier relationship between the United States and COCOM. While in the past the international export controls lists reflected U.S.-initiated controls, currently they more closely reflect the consensus of the COCOM members. The United States export control lists are modified periodically in accordance with reviews of international considerations.[13]

C. CURRENT U.S. EAST-WEST TRADE CONTROLS

The EAA of 1979 provides the current legal authority for U.S. unilateral and multilateral controls on East-West trade. The unilateral controls consist essentially of an export licensing system administered by the Department of Commerce. The multilateral controls systems operates in the context of COCOM.

Unilateral controls.—Under the EAA of 1979, the Department of Commerce is authorized to control exports of goods or technology, including the financing, transporting or servicing of such exports.[14] The following types of transactions are regulated: 1) exports of commodities and technical data from the United States; 2) reexports of U.S.-origin commodities and technical data from one foreign country to another; 3) exports and reexports from a foreign country of foreign products containing U.S.-origin parts and components; and 4) exports and reexports from a foreign country of foreign products based on U.S.-origin technical data. The Department of Commerce is also authorized to control any goods and technology exported by persons subject to the jurisdiction of the United States, such as exports of foreign-origin goods or technology by foreign subsidiaries of U.S. companies, but such exports are not currently regulated if they are 1) of foreign manufacture; 2) contain no U.S. materials; and 3) are not based on restricted U.S. technology.

In principle, all exports from the United States, except those to U.S. territories and to Canada, are subject to a licensing procedure. The vast majority of exports qualify for a general license and in, effect, require neither a formal application to export nor a specific license for each shipment. Depending on the destination, a validated export license may be required for exports of a limited number of products, commodities and technologies.

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[13] General Accounting Office (1976).

[14] The discussion of U.S. unilateral controls relies heavily on U.S. Department of Commerce, International Trade Administration (1981 a, b).

For export controls purposes, foreign countries are divided into several groups, with differing degrees of export restrictions applicable to each. At one extreme are the industrial nations and Western Hemisphere countries to which exports are not controlled for national security reasons. At the other extreme is a group of four nations (North Korea, Vietnam, Kampuchea and Cuba) to which virtually all trade is currently under embargo. The CMEA nations fall into three groups between these two extremes. In increasing level of severity of export controls the three groups are: 1) Romania; 2) Poland and Hungary; and 3) Bulgaria, Czechoslovakia, East Germany and the Soviet Union. It should be noted that, depending on the climate of overall relations, a specific country may be shifted from one export control group to another. For example, in June 1980, export controls vis-a-vis Hungary were liberalized from treatment similar to Bulgaria, Czechoslovakia, East Germany and the Soviet Union to treatment at par with Poland.

Products or commodities whose export is controlled for national security, foreign policy or short supply considerations (i.e., they require a validated export license) are specified in the Commodity Control List (CCL). Items controlled for national security reasons on the CCL are so-called "dual-use" items, that is, those having both civilian and significant potential military application. The CCL also lists technologies, products or commodities such as crime control and detection equipment controlled for foreign policy reasons as well as certain exports related to nuclear weapons, explosive devices and nuclear power facilities. The CCL is maintained by the Commerce Department and reviewed annually to reduce the number of items in the list to the minimum consistent with short supply, foreign policy and national security considerations.[15] Each entry in the CCL contains a description of a product or commodity, the destinations for which a validated export license is required, the reason for control, unit of control and, where applicable, dollar value limits. At the end of 1981, the CCL contained approximately 160 items, the majority of which also appeared in the COCOM lists; some 30 items in the CCL were controlled unilaterally by the United States.[16] Technical data exports, including know-how and computer software, are controlled according to a special set of regulations similar in many respects to those applicable to products or commodities.[17]

In an effort to reduce to a minimum the items subject to controls for national security reasons, the EAA of 1979: 1) required that foreign availability be considered in determining whether exports of products or technologies should be controlled; 2) encouraged the incorporation of an indexing technique to remove technologically-obsolete items from controls; and 3) limited controls to militarily critical goods and technologies.

As noted above, the Commerce Department is prohibited from imposing export controls on products or technologies determined to be available without restriction from sources outside the United States unless "adequate information has been presented . . . demonstrating that the absence of such controls would prove detrimental to the foreign policy or national security of the United States." Should controls be imposed notwithstanding foreign availability, negotiations must begin immediately with the foreign country to eliminate such availability. Whenever it can be demonstrated that goods or technologies substitutable for those controlled by the United States are available without restriction from foreign countries, the Department of Commerce must remove the controls on the U.S. items. The technology indexing proposal aims to remove technologically-obsolete items from controls through an annual review of the performance levels of controlled items. Products or technologies which no longer meet the performance levels of the most recent review are automatically removed from controls unless an exception similar to that applicable to foreign availability is obtained.

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[15] The CCL is published in the Code of Federal Regulations at 15 CFR 399.

[16] Statement of Frank C. Conahan, Director, International Division, General Accounting Office, before the Subcommittee on International Finance, Senate Banking, Housing and Urban Affairs Committee, April 30, 1981, p. 3.

[17] The regulations covering exports of technical data are given in the Code of Federal Regulations at 15 CFR 379.

Perhaps more important than the two changes discussed above was the introduction in the EAA of 1979 of the concept of "critical technologies." The concept was developed by a private sector task force on export of U.S. technology convened by the Department of Defense in 1975. In a report issued in February 1976,[18] the task force reached three important conclusions: (1) the proper object of strategic export controls is design and manufacturing know-how rather than products embodying such processes alone; (2) active transfer mechanisms (such as the sale of turnkey plants, joint ventures, patent licenses, training programs) are potentially more detrimental to the national security than passive transfers (such as sales of products, which usually do not incorporate current design and manufacturing technology); and (3) the objective of controlling exports of strategic technologies is to protect the lead time the United States has in these areas.

Following the recommendations, the Congress ordered the Secretary of Defense to develop a Militarily Critical Technologies List (MCTL) with the intention of removing controls on all other products or technologies. The MCTL will contain: (1) arrays of design and manufacturing know-how; (2) keystone manufacturing, inspection and test equipment; and (3) products accompanied by sophisticated operation, application, or maintenance know-how.

The concept of controlling exports of "keystone" equipment is particularly important. The task force report recognized that militarily significant processes generally comprise several pieces of general or multipurpose equipment and at least one "keystone" piece of equipment. The keystone equipment is essential and completes the process line to allow it to be fully operational. Controlling exports of the keystone equipment, which might take the form of computer-controlled process, inspection, or test equipment, prevents the transfer of a militarily-critical technology and reduces the economic cost on exporters of general or multi-purpose equipment.

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[18] Department of Defense, Office of the Director of Defense Research and Engineering (1976). See also Bucy (1977) and (1980).

Multilateral controls.—The principal activities of COCOM are: the identification of products and technology mutually agreed to be of strategic significance and whose exports to Eastern Europe, the Soviet Union and other countries should be restricted; preparation of lists of such items; consultations on exceptions to the lists; and consultations on enforcement. Three distinct lists are maintained by COCOM: (1) a munitions list; (2) an atomic energy list; and (3) an industrial/commercial list. The lists are reviewed approximately every three years. In general, there is little disagreement among members on the products and technologies to be included in the first two lists. With reference to the industrial/commercial list, however, differences do exist on whether or not certain dual items should be included in the list and whether exports of these items should be prohibited, controlled quantitatively, or simply monitored.

The bulk of the COCOM operations is related to reviewing requests submitted by the member countries for permission to export items in the prohibited category. These exception requests are examined on a case-by-case basis under several criteria: technical specifications of the proposed export, proposed end use and end user, availability of the product or technology outside COCOM, etc. Exception decisions must be unanimous since, as a voluntary organization, COCOM has no power to enforce decisions on members. The secrecy surrounding COCOM operations does not permit a thorough examination of the process involved in granting exceptions but it appears that the vast majority of exception requests are approved. In 1977, 836 of 1087 exception requests, accounting for 68 percent of the value of proposed exports, were approved by COCOM.[19]

III. A MODEL OF EXPORT CONTROLS: A CARTEL PERSPECTIVE

In this section we summarize a model developed to evaluate the economic impact of unilateral and multilateral export controls. In Section IV results of simulations with the model and data for 1976 are used to illustrate its potential as a tool for analysis. A much more detailed description of the methodology is available in Bayard, Pelzman and Perez-Lopez (1982). The focus here is on sketching a framework which permits policy analysts to measure the potential economic costs and benefits of imposing hypothetical controls on Western exports to any or all of the CMEA countries. We do not attempt to evaluate either the political implications of controls or the economic impact of the current system of controls.

In this admittedly narrow context, the economic costs for the West of imposing additional controls are: 1) the short run adjustment costs due to the potential loss of Western output and employment opportunities; 2) plus the costs of administering the controls; 3) less any terms of trade gains associated with higher export prices resulting from supply restrictions. The economic benefits for the West of trade controls are the costs imposed on the CMEA nations, that is, the value of the resources CMEA would be willing to expend to prevent the imposition of controls.[20] (See Appendix 1 for a diagrammatic illustration of how these costs and benefits are measured.)

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[19] McIntyre and Cupitt (1980), p. 100.

Prior to determining costs and benefits of controls, it must be noted that the economic effectiveness of export controls depends on the Western exporters' oligopoly power—their ability to restrict sales and raise prices. Consequently, much of the discussion is based on the theory of cartels since, except for rare occasions, effective use of export controls would require explicit coordination and control of a number of exporters and importers. In what follows, the factors which determine potential oligopoly power are first reviewed and then the problems of building an effective coalition of exporters (hereafter referred to as a political export cartel), allocating costs and benefits among members, and policing and enforcing the controls are discussed. The section concludes with a brief discussion on the applicability of the model to Western controls on exports to CMEA.

A. FACTORS DETERMINING POTENTIAL OLIGOPOLY POWER

A political export cartel's potential ability to impose economic costs on targeted importers depends on the ease with which the cartel can raise import prices by collectively restricting exports. The elasticity of import demand facing the cartel is a measure of the importers' dependence on exports from the cartel and a useful summary indicator of the cartel's ability to increase prices. The more inelastic the demand for cartel exports, i.e., the less responsive are importers' purchases to a given change in price, the greater is importers' dependence on exports from the cartel.

The elasticity of targeted countries' demand for imports from the cartel (dc) is determined by several factors: the total elasticity of demand of targeted countries for a given good, regardless of source (dw), the elasticity of non-cartel supply (E), the cartel's share of total exports of the good to target countries (S), and the possibilities for substituting between cartel and non-cartel output (r). Assuming perfect substitutability between cartel and non-cartel output, dc can be calculated as:[21]

$$dc = \frac{dw}{S} + E\,\frac{(1-S)}{S} \qquad (1)$$

However, if cartel and non-cartel products are not perfect substitutes, dc is determined by:

$$dc = \frac{E((1-S)r + Sdw) + rdw}{S(r-dw) + dw + E} \qquad (2)$$

where r is the elasticity of substitution between cartel and non-cartel output. While Section IV will present some illustrative simulations in which we have attempted to make estimates of dc for a sample of product categories, target countries and export coalitions, it is useful to discuss the determinants of the elasticity of demand for cartel exports and their relationship to the issue of export controls.

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[20] Additional controls refer to those incremental to the controls already in place in 1976, the year chosen to simulate the model. Adjustment costs are defined to include the social costs of involuntary resource displacement. These social adjustment costs will fall over time as capital, labor and other resources become reemployed. However, in the absence of Western monopoly power in export markets, there also will be a permanent social loss due to resource misallocation. See Bayard, Pelzman and Perez-Lopez (1982) for more details.

[21] See Armington (1969a,b) and Van Duyne (1975) for derivations.

The target countries' import demand elasticity for a given product (dw) is determined by a number of factors. In cases where imported and domestically produced goods are perfect substitutes, the demand for imported goods is the difference between the quantity demanded by domestic buyers and the amount supplied by domestic producers at any given price. The less elastic are domestic supply and demand, the less elastic is total import demand.

The short-run elasticity of domestic demand reflects both lags in buyers' adjustments to a price change and the availability of feasible substitutes at the prevailing price. The longer it takes buyers to adjust their purchases to a price increase and the fewer the close substitutes available, the more inelastic domestic demand will be. The short-run elasticity of domestic supply reflects the ease and expense with which resources can be transferred among competing production processes and the availability of domestic stockpiles of the good. Domestic supply is more inelastic, the more specialized and scarce the resources required for production and the smaller the quantity of the good available in inventories or stockpiles. The extent of a nation's import dependence is directly related to the magnitude of the gap between domestic production and consumption and the degree of difficulty in changing consumption and production patterns in response to a price increase. Import demand elasticities are usually more inelastic in the short than in the longer run because it takes time to adjust to price shocks. For this, and other reasons discussed below, the cartel's oligopoly power will tend to erode over time.

A cartel-induced price increase will provide incentives for countries not party to the cartel to increase their exports to the targeted importers. The responsiveness of non-cartel suppliers to a price increase, the elasticity of non-cartel supply (E), also depends on the ease and expense of shifting resources to increased production and on the existence of stockpiles of the good. The more difficult it is for non-cartel members to quickly increase production and exports of the restricted good or to divert domestic consumption or stocks to exports, the lower will be the elasticity of non-cartel supply and the elasticity of demand for cartel imports.

Transshipment of controlled goods may significantly weaken the cartel's effectiveness. In this context, cartel effectiveness is not appropriately measured as the ability to deny targeted importers access to certain goods or technology (although this may be a legitimate goal of export controls). Rather, effectiveness is measured as the ability to raise the price paid by targeted importers; in other words, to increase the resource costs of acquiring these goods. Effective control of prices requires either a uniform restriction of exports to both targeted and non-targeted importers, or else a system of discriminatory export controls and prices, combined with effective control of non-targeted countries' ability to transship to targeted importers.

In the first case, with effective uniform restrictions in total cartel exports to both targeted and non-targeted importers, transshipments are not really an issue, because the cartel has raised the cost of imports to targeted countries, whether they buy from the cartel directly, or whether imports are transshiped. However, in the case of discriminatory restrictions on targeted and non-targeted importers, transshipment is a critical issue. As we discuss in more detail below, there may be a number of reasons for the cartel to maintain a two-tiered discriminatory pricing system for targeted and non-targeted importers. But the cartel will have no effective control over prices and will cause minimal damage to targeted importers if it simultaneously allows non-targeted importers uncontrolled access to cartel exports and lacks control over transshipments from these countries to targeted importers. In this case, targeted and non-targeted importers have incentives to collude to divert cartel sales to targeted importers, at prices intermediate between those established for targeted and non-targeted markets. The cartel's ability to prevent transshipment will be discussed below.

There are probably very few internationally traded goods for which there exist either perfect substitutes or no substitution possibilities at all. Certain ostensibly homogeneous grains are in fact often distinguishable by significant differences in protein content and quality. Certain computers may have unique computational capabilities, but the same calculations or functions can usually be done more slowly and laboriously with less sophisticated machines. The lower the substitutability between cartel and non-cartel goods (r), the less elastic dc will be.

The cartel's potential oligopoly power also depends on its share of total exports of the commodity. The larger the shares of both total world exports and of exports to targeted countries controlled by the cartel, the lower the elasticity of demand for cartel exports. On these grounds the cartel has incentives to include as many exporters as possible among its members. However, as we discuss below in part B, the cost of bargaining, policing and enforcing export controls increase very significantly with the number of members.

To summarize: the target countries' elasticity of demand for cartel goods is critically important in determining the economic costs and benefits of export controls. The more inelastic is import demand facing the cartel: the larger are the costs imposed on targeted importers, the larger is the cartel's potential terms of trade gain for any partial (i.e., non-prohibitive) restriction in exports, and the smaller the cartel's adjustment costs for any given export price increase.

At one extreme, if demand by targeted importers is perfectly elastic, the cartel would be unable to impose any economic cost on these importers, but would itself incur substantial displacement costs if it attempted to restrict exports. At the other extreme, perfectly inelastic import demand would allow the cartel to inflict almost unlimited short run economic costs on targeted importers, without itself experiencing any displacement of productive resources. Between these two extreme demand conditions, the cartel's scope for restricting trade will depend on a variety of factors, including not just the import demand elasticity, but also the cartel members' willingness to bear displacement costs, and other factors affecting cartel stability. We now turn to a discussion of the factors underlying a cartel's stability and cohesiveness.

B. FACTORS AFFECTING CARTEL STABILITY

The preceding discussion of oligopoly power in a politically motivated export cartel was cast in terms of *potential* power because it was assumed that the cartel operated as a cohesive and stable group. In practice, the effective exercise of oligopoly power in either political or economic cartels is hampered by divisive forces internal and external to the cartel which threaten their stability. Although these problems are interrelated and frequently must be resolved simultaneously, they can be broken down conceptually as follows:[22] (1) determining the desired level of export restriction for the various commodities controlled by the cartel; (2) allocating reduced exports among the cartel members; (3) sharing the costs and benefits among members; (4) detecting violators of the agreement; (5) enforcing the agreement against violators; (6) controlling noncartel exports, transshipments, and the development of substitutes and backstop technologies; and (7) responding to targeted importers' retaliation.

In what follows, we discuss briefly how these problems affect cartel stability and the costs of maintaining effective export controls.

Determining the desired level of export restrictions.--The determination of feasible export restrictions must be made on a fairly detailed commodity basis, depending in large part on the elasticity of import demand facing the cartel. The size of the cartel, both in terms of the number of individual countries participating and their individual shares of total world exports, is an important decision variable which influences both the elasticity of import demand and the costs of maintaining a stable cartel. The larger the share of exports controlled by the cartel, the lower will be the elasticity of import demand, the larger will be the potential terms of trade gains and the easier it is to inflict damage on targeted importers. On these grounds, the cartel has incentives to include as many exporters as possible.

However, the costs of reaching a comprehensive agreement on the magnitude of export restrictions depend on the number and size distribution of the participating exporters. In bargaining over the level of restrictions, the smaller the number of exporters in the cartel and the larger their collective share of total world exports of the commodity, the easier it will be to reach an agreement. The collective goods nature of political cartels, the benefits of which are at least in part non-rival and non-exclusive, makes it difficult to induce relatively small exporters to cooperate because their individual contribution to the cartel's success will be relatively small, while they can expect to receive some benefits whether they participate or not.[23] An export cartel is therefore likely to be more effective if it does not have to rely on many small exporters to control a large share of total world exports.

Allocating reduced exports and sharing costs.—The decision on the level of export restrictions is also affected by the problem of allocating the reduced level of exports and the costs (and any terms of trade gains) of the restrictions among the individual members. Under certain conditions it is possible conceptually to separate the problem of allocating exports from the problem of sharing costs and benefits among the individual participants. However the allocation and sharing problems are so closely related that they are best considered together.

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[22] See Osborne (1976) for a similar list.

[23] Olson (1965).

The political export cartel generally will face difficult problems in allocating reductions in exports among its members. On efficiency grounds, a reduction in exports should be allocated among producers so as to equalize marginal production costs across all producers. In practice, this would mean that high cost, relatively inefficient producers would be allocated larger production and export reductions than lower cost producers. This is the same rule that profit maximizing cartels would follow. The rationale is the same for both types of cartels: assigning export "quotas" so as to maintain equalized marginal production costs will maximize collective cartel profits, or minimize collective losses. In principle, following the efficiency rule will increase the resources available to compensate the high cost producers for their disproportionate losses.

However, using this rule to allocate production cutbacks is likely to be a serious source of conflict within the cartel. Exporters with relatively high production costs will bear a disproportionate share of the cutbacks, and are unlikely to accept the rule without an additional mechanism which "taxes" the relatively low cost exporters in order to compensate the higher cost producers.[24]

Establishing a tax/subsidy scheme would be a potentially significant cost of maintaining collective export controls. As we discuss below in connection with policing and enforcement costs, the cost equalization rule is not necessarily the most efficient allocation scheme, given that its use may require the cartel to expend resources on both a tax/compensation mechanism, as well as on special policing and enforcement problems associated with high cost producers.

Moreover, the cost equalization rule implicitly assumes that marginal adjustment costs for resources displaced by the reduction in exports are identical for high and low cost producers. These adjustment costs depend on industry characteristics (e.g. productivity, labor turnover, occupational and demographic characteristics of the industry work force), on labor market conditions (e.g. the stage of the business cycle, industry, national and local unemployment rates), and on the availability of government compensation and adjustment assistance programs. In consequence, adjustment costs are likely to vary greatly across countries, in any given industry. This diversity will cause difficulties in bargaining over the allocation of cutbacks.

Effective internal domestic opposition to export controls, although it depends in part on actual adjustment costs, also depends on the characteristics of those affected and on the form of government.[25] These factors also vary greatly across countries and this diversity increases the difficulties of reaching agreement on an allocation scheme.

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[24] Bain (1948).

[25] See Baldwin (1982).

In addition to differences in production and adjustment costs, differences in the size distribution of producers can contribute to conflicts over the allocation of production quotas. As noted earlier, relatively small producers may have significant bargaining power vis-a-vis large producers because they can often credibly threaten to stay out of the cartel unless they are allocated a disproportionately small share of the cutback (or a relatively large share of the terms of trade gains, if any).

The cartel's ability to reach an agreement both on the overall (i.e. cartel-wide) restriction in exports and on the allocation of this reduced level of exports among the members depends critically on how the costs and benefits of export restrictions are shared among the exporting countries. The logic of collective action in a multilateral export cartel makes the problem of devising a way to share these costs and benefits a very difficult one.[26]

A political export cartel may have several advantages over conventional profit maximizing cartels because the potentially wider range of products subject to controls may both provide the cartel with much greater scope to tailor the various commodity restrictions to the desires of the individual participants, which would decrease bargaining and policing costs, and also increase the cartel's potential oligopoly power.[27]

One advantage of multi-product export restrictions is that, if countries are characterized by significant differences in comparative advantage and adjustment costs, it may be possible to induce producers of goods with relatively high production costs and/or low adjustment costs to accept larger cutbacks in those products if they simultaneously obtain relatively small reductions for other products in which they have relatively low production and/or high adjustment costs. Exporters who bear a large share of the costs of restricting goods in which they have a comparative cost disadvantage could be indirectly compensated by being given a relatively small (large) share of the costs (benefits) of restricting other goods. While this sort of tailoring is unlikely to induce many otherwise recalcitrant exporters to join the cartel, it may help to reduce the costs of bargaining over production and cost allocations and may result in larger cuts in exports than would occur if only a few products were subject to controls.

The other potential advantage of a multi-product political export cartel is that, to the extent that the cartel can exert some control over exports of goods which are substitutes for each other, it may have greater potential oligopoly power than if it controlled a single product. For example, the cartel will tend to face a lower elasticity of import demand for feed corn if it also is able to restrict exports and raise the price of substitutes like soybeans. Greater oligopoly power for the cartel translates into larger potential terms of trade gains, smaller adjustment costs and correspondingly fewer difficulties in bargaining over the allocation of costs and benefits.

In all of the preceding discussion of sharing the costs and benefits of export restrictions it was assumed that these restrictions were imposed on markets which were previously characterized by a high degree of competition. The cartel was assumed to incur some adjustment costs (which may or may not be offset by terms of trade gains) in restricting its exports. In contrast, if prior to establishment of the cartel targeted importers were assumed to exercise monopsony power by depressing the prices they paid for imports, it may be possible for the cartel to increase its export prices without restricting exports and without necessarily incurring adjustment costs.

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[26] See Bayard, Pelzman and Perez-Lopez (1982) for a discussion of various sharing schemes.
[27] Stigler (1974).

In the face of import monopsony in the targeted countries, higher export prices could be achieved by levying export taxes (which are illegal in the United States), or quotas or by establishing an international marketing organization which sets prices and quantities. In situations of bilateral monopoly, the terms of trade depend on relative bargaining strengths and it is difficult to predict the ultimate outcome. However, if targeted importers were already exercising monopsony power before the cartel imposed controls, it is likely that the creation of a cartel sales organization will shift the terms of trade in the cartel's favor. In these situations, the cartel might incur no adjustment costs and could obtain possibly large terms of trade gains. Bargaining over the costs and benefits of cartelization would be somewhat easier than in situations where adjustment costs are high.

Detecting violators of the agreement.—In both political and economic cartels the participants have financial incentives to cheat on the agreement by surreptitiously increasing their sales to targeted importers. The post-war experience with controls on East-West trade suggests that even when Western governments agree on their political goals, they often face intense pressures from domestic producers to formally relax or otherwise allow them to circumvent controls, especially if exporters believe their foreign competitors have been cheating.

One way to help reduce domestic opposition to export controls is to establish a domestic compensation mechanism which would offset part or all of the net losses incurred by exporters. The larger are the cartel's terms of trade gains, and the more "equitably" they are distributed to individual countries, the easier it will be for member governments to preempt domestic opposition to controls. Since most governments already have systems of tax credits and unemployment compensation, the administrative costs of compensation may be fairly low, although there is likely to be considerable controversy over appropriate levels of compensation.

Individual governments may also be able to reduce internal opposition if they can assure domestic producers that they are monitoring sales by other cartel members. To do this, governments already have at their disposal farily sophisticated monitoring and intelligence systems. There are also strategies to detect deviations of sales from assigned market shares. The fact that many of the goods likely to be controlled (e.g. food and high technology goods) are differentiated and identifiable by country of origin can facilitate the process of detecting violations. The number and size distribution of exporters in the cartel also plays a role in determining policing costs. It is easier to monitor shipments and identify violations if the cartel is composed of a relatively small number of large exporters.

Enforcing the agreement against violators.—The incentive for members to violate the cartel agreement depends both on the expected financial gains from undetected cheating and on the probable economic and political costs, if cheating is detected and punished. The gains from unpunished violations are lower overall adjustment costs plus the profits earned by sales in excess of the cartel-imposed limits. The expected economic costs of cheating depend on how the other cartel members respond.

The political cartel will find it difficult to tolerate widespread or large scale cheating because it spells the likely demise of the cartel. The cartel has two complementary strategies to deter cheating: (1) it can identify potential cheaters in advance and attempt to reduce their expected gains from cheating; and (2) it can develop contingency plans to respond quickly to serious violations, thereby reducing the expected gains and increasing the expected costs.

Potential cheaters have several readily identifiable economic characteristics. They often will tend to be relatively small producers who sell standardized goods. These small producers recognize that it is costly to monitor and detect small-scale violations, especially if the goods they sell are difficult to identify by country of origin.

The temptation to cheat also depends on the availability of excess export capacity (including stockpiles) and the costs of maintaining it. If the cartel initially allocated relatively inefficient producers (i.e., those characterized by high production and adjustment costs) large cutbacks and failed to at least partly compensate them, the temptation to cheat may be great.

In bargaining over the initial allocations of production cuts and cost/benefit shares the cartel should recognize that small producers and those with relatively high production and adjustment costs are prime candidates to cheat. The cartel can reduce incentives to cheat by allocating these exporters relatively small production cuts and cost shares, and relatively large shares of the benefits. This involves trading off some allocative efficiency for reduction in the costs of policing and enforcing the cartel. It is also the solution likely to emerge based on relative bargaining strengths.

The cartel also should be able to respond quickly to serious violations. The longer the response lag, the greater are the expected benefits of cheating and the lower are the expected costs. The cartel should engage in serious contingency planning to determine in advance how it will respond to cheating.

In an economic cartel a prime deterrent to cheating is a credible threat that the other members of the cartel will respond quickly by lowering their export prices and forcing the cheater to engage in ruinous competition.[28] Since the purpose of the political cartel is to inflict damage on targeted importers, this strategy would be self-defeating in the short run. To the extent that the cartel's goal is to impose long run damage on targeted importers, it may be worthwhile to pursue a price-cutting strategy in the short run if it creates a credible deterrent to future cheating and thereby increases the cartel's long run effective oligopoly power.

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[28] Stigler (1968), Shubik (1960), Telser (1966).

However, the political cartel may have other, less self-defeating, strategies available to deal with violations. If the cartel members are economically interdependent it may be possible to punish violators in ways which avoid benefiting targeted importers. What follows is a non-exhaustive list of possible options.

(1) members can raise tariffs or other trade barriers against violators;

(2) members can deny credit and technology flows to cheaters;

(3) members can deny violators access to shared factors of production like pipelines, canals, fishing grounds etc.;

(4) members can deny violators the right to bid on government contracts (including defense procurement);

(5) all members can be required to place money into an escrow account and violator's shares can be impounded.

Controlling noncartel exports, transshipments and development of substitutes and backstop technologies.—If the cartel is successful in the short-run in raising export prices to targeted importers, it will create incentives for these importers to seek new sources of supply. Unless the cartel can control new supplies; its oligopoly power will tend to erode over time, in some cases very quickly.

If the cartel's goal is to inflict short run damage on targeted importers (perhaps with the expectation that these importers will acquiesce to the cartel quickly), it may be possible to reduce the elasticity of noncartel supply by negotiating an agreement with noncartel suppliers to hold their exports to targeted importers at historic levels, however measured. To achieve an agreement, the cartel must be able to monitor non-members' exports and punish violators. Much of the earlier discussion of monitoring and enforcing the cartel agreement among the formal members applies with equal force to non-participants who agree not to "take advantage" of the cartel's controls. For most of the products which are likely candidates for export controls, monitoring noncartel exports is probably not difficult. As with cheating by cartel members, the real problem is in developing effective punishments.

Transshipment of restricted commodities is a problem when the cartel attempts to price discriminate between targeted and non-targeted importers. The cartel may have several good reasons to differentiate between targeted and non-targeted importers. One reason is that, if the cartel can effectively separate targeted from non-targeted importers, smaller export restrictions will be required to raise export prices to targeted countries and impose a given amount of damage on them. A second reason for discriminating is that it reduces world-wide opposition to export controls. A third reason for discriminating is that the cartel is afforded more scope to allocate the costs and benefits of restrictions among its members if it also can allocate members shares of non-targeted markets. For example, the cartel can help reduce certain temptable members' incentives to cheat if it gives them disproportionately large shares of non-targeted importers' markets.

The cartel may have considerable economic leverage to prevent transshipments by non-targeted importers in whose favor it discriminates. Price discrimination benefits these favored importers (prices may even be below pre-control world prices) and the cartel may be able to deter transshipments by threatening to deny transshippers the benefits of lower prices. It may pay the cartel to demonstrate its willingness to punish countries which transship (by treating them as targeted importers) if this deters others.

The decision to price-discriminate involves weighing the tradeoffs. Discrimination may reduce the costs of imposing damage on targeted importers, but it may also increase the costs of monitoring and enforcing the agreement.

The development of substitutes and backstop technologies which reduce targeted importers' dependence on cartel exports is a long run problem for the cartel. There are at least two schools of thought on the ultimate implications of encouraging targeted importers to develop alternatives to cartel exports. We consider the implications of substitutes and new technologies for market economies here, and raise the issue again in the context of non-market economies in part C of this section.

The cartel can inhibit these developments by setting its prices just below those which make it profitable to develop new substitutes. Uncertainty both over the cost of developing alternatives and the expected duration of controls also may reduce the economic incentives for importers to search for substitutes. For the same reasons, it also will be difficult for the cartel to determine the appropriate limit price with much precision. However, at least in dealing with market-oriented importers (or non-cartel exporters) whose decisions are largely determined by economic cost/benefit calculations, the cartel may be able to delay the erosion of its oligopoly power by a judicious pricing strategy. Moreover, the development of substitutes or new techologies itself imposes a significant long run cost on targeted importers, which is consistent with the cartel's objectives. As we discuss in part C, this last statement may not be true for non-market importers.

Responding to retaliation.—The imposition of controls on exports to targeted importers may provoke retaliation, both in trade and in other arenas. This discussion focuses on trade retaliation, while recognizing that diplomatic or even military retaliation are potentially very important problems.

The subject of retaliation to trade restrictions is at best a nebulous one, because both specific behavioral assumptions and detailed information on price and income elasticities of import demand are required to reach even remotely realistic conclusions. The fundamental question is: under what circumstances will it be economically worthwhile for targeted importers to retaliate by restricting their exports to (or imports from) the cartel?

In general, targeted importers have more economic incentive to retaliate, the more inelastic is the cartel's demand for imports from targeted countries, and the more elastic is their demand for imports from the cartel. In the final analysis, not much more can be said than that, to determine its vulnerability to retaliation the cartel must make the same calculations (in reverse) that it made to determine its potential oligopoly power.

C. RELEVANCE OF THE MODEL TO SOVIET-TYPE NONMARKET ECONOMIES

There are two prominent features of Soviet-type centrally planned economies (CPEs) which may affect the efficacy of Western export controls: 1) in centrally planned economies the decision to import is made largely on the basis of imports' perceived contribution to the achievement of the objectives of the long term plan, and 2) the allocation of resources within a CPE is determined largely by administrative fiat rather than on the basis of price signals. These features may have important, but conflicting, policy implications for Western decision-makers.

The fact that goods are imported on the basis of a long run plan implies that import demand in a CPE is likely to be relatively price inelastic. Planners may be sensitive to expected import prices while they are in the process of developing the plan, but once it has been formulated, decision-makers are likely to be insensitive to changes in import prices, at least until plans can be redrawn.[29] Moreover, when imports from the West are used to cushion the economy against shortfalls in planned production, import demand is also likely to be fairly inelastic, again depending on decision-makers' willingness and ability to revise their plans. From the West's perspective these institutional rigidities, as reflected in the CPE's inelastic demand for imports, may contribute to the cartel's ability to inflict potentially significant economic costs on targeted CPEs.

However, a second feature of CPEs, the allocation of resources by fiat rather than by price, may have just the opposite implication for the West's ability to impose costs on targeted CPEs. In general the costs of higher import prices to targeted importers are the additional resources they must expend to acquire higher priced imports, to utilize less efficient production processes, and to develop costly substitutes or new technologies. All of these fall under the heading of the costs of being forced to make inefficient reallocations of resources.

In contrast to a market economy where an import price increase would force a reallocation of resources from more to less efficient uses, the same price increase might have precisely the opposite effect in a CPE. In the absence of strong economic incentives to use resources efficiently, the mere imposition of Western export controls may provoke an administrative impetus to utilize existing resources more efficiently and/or to exploit more efficient, but heretofore unused, substitutes or technologies. While this will take time, and may be costly in the short run, it may also result in a net long run economic gain for the CPE.[30] Hence the imposition of controls may be counterproductive from the cartel's perspective because it may cause improved rather than reduced efficiency in a targeted CPE. If this scenario is plausible, the economic model developed here is irrelevant, and so is the very notion of using export controls for other than symbolic purposes.

There is another closely related aspect of CPEs which may make both this model and the notion of controls as an instrument of coercion irrelevant for policy purposes. Export controls are simply a means to an end: the objective of controls is to force decision-makers in targeted countries to change their behavior by imposing unacceptable costs on them. For controls to be effective, policymakers in targeted countries, whatever their market orientation, must weigh the costs of controls against their (political, diplomatic, economic and military) objectives, and conclude that the benefits of changing their behavior exceed the costs.

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[29] Wolf (1982), Holzman (1968) and Pelzman (1982).

[30] Gustafson (1981).

Even if the cartel succeeds in imposing significant costs on targeted CPEs, policy-makers there may not conclude that these costs are unacceptable, because of several factors characteristic of Soviet-type non-market economies. For one thing, the absence of reliable market signals may make it difficult for CPE leaders to evaluate, at least in the short run, the true costs of controls. Short term ignorance may be bliss. Over time, both CPE planners and the public will become increasingly aware of the costs, but the cartel's oligopoly power is also likely to erode over time. The ability to endure economic hardship, whether out of ignorance or determination, will play an important role in determining the effectiveness of controls.

Policy-makers in the West may hope that as planners and the public in targeted CPEs become aware of the true costs of controls, they will become increasingly unwilling to accept these costs. It is possible that, by forcing significant resource reallocations, export controls may provoke considerable domestic discontent in the CPEs. However, it is also possible that an outside threat like controls may be a unifying force which increases both policy-makers' and the public's determination to bear costs. Even if public dissent emerges, Soviet-type CPEs have proved in the past to be very effective in repressing it.

Certainly, at some point, the costs of controls may become unbearable, but the Soviet-type CPEs have shown a remarkable ability to depress their civilian consumption in order to achieve military and strategic objectives. The ultimate efficacy of export controls against CPEs will depend both on the costs imposed and on the CPE's continued ability to reduce consumption below recent levels. The framework proposed here may be useful in assessing the magnitude of the costs of controls, but it says nothing about targeted countries' ability to bear these costs. For the economic model to be useful in an analysis of the ultimate political efficacy of controls it must be imbedded into a broader, and detailed, analysis of both the cartel's and targeted importers' objectives.

IV. SIMULATION RESULTS

The model developed in Section III was simulated for a set of hypothetical controls using 1976 United Nations trade data. These simulations per se do not constitute an evaluation of the efficacy of actual or proposed controls on Western exports to CMEA. A policy analysis of export controls must consider two closely related questions: (1) can unilateral or multilateral controls be used to inflict economic costs on certain targeted importers, and what are the costs to exporters? and (2) does the imposition of economic costs on importers help exporters to achieve their ultimate political objectives? The model presented in Section III is designed to help answer the first question. The simulations of the model show some calculations of the costs and benefits of hypothetical export controls, not because these hypothetical controls are necessarily possible or desirable, but simply to illustrate how the model could be used. The model and the simulations also do not shed any light on the all-important question of the efficacy of controls in achieving political objectives. With these caveats in mind, the trade data and simulations results are discussed below.

A. TRADE PATTERNS

The year 1976 was chosen as the basis for the simulations because it was thought that trade data for that year would represent the "normal" pattern of trade which emerged in the period of East-West detente and also to divorce the simulations from current policy considerations. Tables 1 and 2 summarize recent trends in East-West trade.

TABLE 1.—CMEA TRADE WITH WESTERN INDUSTRIALIZED COUNTRIES, LESS DEVELOPED COUNTRIES AND CENTRALLY PLANNED ECONOMIES

[Dollars in millions]

Destination/Origin	1965		1970		1975		1976		1977		1978		1979		Average annual growth rate (percent)		
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	1965–70	1970–75	1975–79
Exports:																	
Western industrialized countries	$4,052	21	$6,774	22	$19,387	26	$22,041	31	$24,848	26	$26,889	25	$37,598	29	10.9	23.5	18.0
Less developed countries	2,772	14	4,754	16	12,404	17	10,776	15	17,015	18	20,001	19	23,297	18	11.4	21.0	17.1
Centrally planned economies	12,443	65	18,363	62	42,075	57	38,631	54	52,805	56	61,090	56	69,727	53	8.1	18.1	13.5
Imports:																	
Western industrialized countries	4,390	23	7,800	26	30,580	36	30,794	40	32,502	33	36,179	32	44,182	34	12.2	31.2	9.7
Less developed countries	2,437	13	3,493	12	11,372	14	8,871	11	13,328	14	14,822	13	17,311	13	7.5	26.0	11.1
Centrally planned economies	12,252	64	18,393	62	42,426	50	37,917	49	52,781	54	62,630	55	68,474	53	8.5	18.2	12.7

Source: U.N. Economic Bulletin for Europe, various editions.

TABLE 2.—TOTAL OECD EXPORTS TO THE CMEA MARKET

[In millions of dollars]

	1970	1975	1976	1977	1978	1979	1980
Canada	134	598	786	540	773	991	1,775
United States	341	2,787	3,502	2,524	3,674	5,674	3,853
Japan	444	2,199	2,798	2,656	3,197	3,244	3,600
Australia	114	466	631	492	475	781	1,330
Austria	370	1,280	1,288	1,421	1,665	1,992	2,100
Belgium	174	858	792	750	850	1,059	1,307
Denmark	117	306	280	283	334	377	390
Finland	364	1,317	1,530	1,717	1,750	1,807	2,815
France	651	2,597	2,736	2,794	2,916	4,027	4,646
Germany	1,300	6,458	6,246	6,709	7,715	8,695	12,670
Greece	107	263	256	332	384	360	525
Iceland	15	41	42	61	50	64	83
Ireland	9	35	20	31	38	72	111
Italy	699	2,175	1,966	2,295	2,409	2,633	2,736
Netherlands	211	797	762	830	940	1,144	1,419
Norway	117	255	275	278	319	246	266
Portugal	8	43	83	80	75	100	92
Spain	66	256	302	286	354	547	546
Sweden	339	1,096	1,032	936	982	1,175	1,195
Switzerland	207	741	794	875	1,060	1,068	1,063
Turkey	83	122	165	168	323	325	463
United Kingdom	620	1,292	1,181	1,437	1,873	2,058	2,628
North America	475	3,385	4,288	3,064	4,447	6,665	5,628
OECD Europe	6,016	21,803	21,779	21,224	26,416	30,409	40,144
Total OECD	6,491	27,853	29,496	27,569	34,535	41,099	45,772

Soucre: OECD, Foreign Trade Statistics, series A.

The data in table 1 indicate that less than half of CMEA's total trade is with non-communist countries. The industrialized Western countries provided less than forty percent of CMEA's total imports and bought about one-third of CMEA's total exports. Western trade with CMEA grew at an average annual rate of roughly 25 percent between 1970 and 1975, but slowed between 1975 and 1979. Table 2 shows that West Germany, the United States, Japan, France, Italy, Finland and Austria were the major exporters to CMEA in 1976.

B. SIMULATIONS

Estimates of the elasticity of import demand in targeted countries, the elasticity of non-cartel supply, the elasticity of substitution between cartel and non-cartel exports and the share of the cartel in targeted countries' import markets are all required to calculate the elasticity of targeted importers' demand for cartel exports. Estimates of these parameters were culled from a variety of sources and, given the great difficulty in obtaining accurate estimates, a wide range of estimates was considered in order to provide reasonable upper and lower bounds to the calculations. The simulations were run for all one-digit SITC groups, for food and feed imports (SITCs 01, 04, 041 and 044) and for technology-intensive products (SITCs 71, 72, 73 and 861).[31] Before presenting the results of the simulations it may be useful to show how the elasticity of demand for cartel exports was derived for one commodity group.

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[31] The list of technology-intensive industries is from Aho and Rosen (1980) where they are defined as those with an R&D content greater than the average for all U.S. goods.

Table 3 shows the trade data and the range of elasticity estimates used for SITC O, Food and Live Animals. The first column in the top panel of table 3 lists the ten largest Western exporters of food and live animals to CMEA (including the Soviet Union). The second, third and fourth columns show Western exports to CMEA, to the Soviet Union alone and to the world. The fifth column shows the cululative share of these exporters to CMEA. For example, the United States exported over $2 billion worth of food and animals to CMEA in 1976, $1.4 billion of which went to the Soviet Union. U.S. exports represented almost 34 percent of CMEA imports from the West in this commodity group. The last column in table 3 shows that exports to CMEA represented about 13 percent of total U.S. exports in this category.

TABLE 3.—SITC 0: FOOD AND LIVE ANIMALS; TOP 10 SUPPLIERS TO CMEA, AND THEIR EXPORTS TO CMEA, U.S.S.R., AND WORLD [1]

[Values in thousands of dollars]

	CMEA	U.S.S.R.	World	Cumulative percent supply to CMEA	Percent CMEA of world
1. United States	2,078,280	1,358,562	15,710,086	33.8	13.2
2. Canada	667,951	472,329	3,985,554	44.6	16.8
3. Brazil	507,460	143,363	4,698,488	52.9	10.8
4. Australia	303,787	291,908	4,100,009	57.8	7.4
5. India	290,229	158,129	1,432,147	62.6	20.3
6. France	263,087	136,021	6,750,755	66.8	3.9
7. Argentina	204,713	157,341	2,454,751	70.2	8.3
8. Germany, Federal Republic of	132,799	25,663	3,613,706	72.3	3.7
9. Egypt	127,900	62,926	278,536	74.4	45.9
10. Ghana	117,530	80,489	525,133	76.3	22.4
Rest of world	1,457,671	629,314	38,873,995	23.7	3.7
Total	6,151,407	3,516,045	82,423,160	100.0	7.5

[1] Total number of suppliers to CEMA, 68.

CALCULATION OF ELASTICITY OF DEMAND FOR CARTEL EXPORTS—VARIOUS CASES

	Import share controlled by cartel	Target countries' import demand elasticity	Elasticity of substitution	Elasticity of noncartel supply	Elasticity of demand for cartel exports
Top N countries in cartel:					
4	0.58	0.1	0	0	0
			3	3.0	.9
			1,000,000	10.0	7.4
4	.58	.8	0	0	0
			3	3.0	1.5
			1,000,000	10.0	8.6
4	.58	1.6	0	0	0
			3	3.0	2.1
			1,000,000	10.0	10.0
7	.70	.1	0	0	0
			3	1.0	.4
			1,000,000	3.0	1.4
7	.70	.8	0	0	0
			3	1.0	1.2
			1,000,000	3.0	2.4
7	.70	1.6	0	0	0
			3	1.0	1.9
			1,000,000	3.0	3.6

The calculation of the elasticity of CMEA's demand for exports from the cartel, under various assumptions, is shown in the bottom panel of table 3.[32] In the first column at the bottom of table 3 assumptions are made about the countries participating in the hypothetical export cartel. In the current simulations only two exporting groups have been considered: the top four and the top seven Western exporters. These coalitions were selected not because they were particularly realistic or likely, but simply to illustrate how the model can be used. The data in table 3 permit policy analysts to make simulations with alternative combinations of potential cartel members. In 1976 the U.S., Canada, Brazil, and Australia together provided about 58 percent of CMEA's total imports of food and live animals from the West. The top seven Western exporters accounted for about 70 percent of CMEA imports in this category.

The third column in the bottom of table 3 lists the range of assumed elasticities of CMEA's demand for imports from all Western sources. For food and live animals, the range is from 0.1 to 1.6. The total import demand elasticities reported in column 3 were taken from a number of sources. The primary source was Stern et. al. (1976). The Stern estimates represent a reasonable range of import demand elasticities for non-communist countries. It is assumed that CMEA's import demand elasticity falls somewhere within this range. There is both theoretical and empirical support for this assumption. As was noted in Part C of Section III, Wolf (1982) and Holzman (1968) suggest that import demand elasticities for CPEs will tend to be low. The limited empirical evidence also supports this assumption. Where possible, Stern's elasticities were supplemented with estimates from Vanous (1981) and Green and Higgins (1977) for the Soviet Union and CMEA. In all cases, a fairly high import demand elasticity has been deliberately included as an upper bound.

In general, there are very few good estimates of the elasticity of substitution, even for trade among Western countries. The fourth column at the bottom of table 3 shows the range of assumptions about the substitution possibilities between cartel and non-cartel exports. At one extreme, the elasticity of substitution was assumed to be zero. This corresponds to Gray's (1981) notion of non-competitive imports. A middle estimate of three was based on Armington's (1969 a,b) assumption, which is frequently used in the absence of empirical evidence. This may be somewhat high. Brada and Wipf (1975) generally found that the elasticity of substitution between Western exports to CMEA countries was less than unity. Finally, as an upper bound it was assumed that there was perfect substitutability between cartel and non-cartel exports.

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[32] It was not possible to estimate demand elasticities for individual CMEA countries (e.g., the Soviet Union) because the United Nations data do not show detailed intra-CMEA trade, except for Hungary and Czechoslovakia.

The fifth column at the bottom of table 3 shows the assumptions about the price responsiveness of non-cartel supply. At the lower end, consistent with an extreme assumption of no substitution possibilities between cartel and non-cartel exports, the elasticity of non-cartel supply was assumed to be zero. Somewhat more realistically, it was also assumed that the elasticity of non-cartel supply depended on the countries in the cartel and their cumulative shares, both of total Western exports to CMEA and to the world for each commodity group.

As a middle value it was assumed that the elasticity of non-cartel supply would be three if only the top four exporters to CMEA participated in the cartel. For food and live animals, the top four exporters supplied about 58 percent of CMEA's imports, and about 33 percent of total world exports in this category. The four-country cartel's share of world exports can be calculated from table 4. When the assumed cartel was expanded to include the seven largest suppliers to CMEA, the elasticity of non-cartel supply was reduced from three to one to account for the larger share of trade controlled by the assumed cartel. For food and live animals, the top seven exporters accounted for 70 percent of CMEA imports, and these seven countries controlled over 43 percent of world exports. At the high end of the range, non-cartel supply was assumed to be ten for the four-country cartel. This is tantamount to assuming perfectly elastic non-cartel supply. The non-cartel supply elasticity was set at three when the cartel was increased to include seven countries.[33]

TABLE 4.—SITC 0: FOOD AND LIVE ANIMALS; TOP 12 SUPPLIERS TO WORLD, AND THEIR EXPORTS TO WORLD AND CMEA [1]

	CMEA	World	Cumulative percent supply to world	Percent CMEA of world
1. United States	2,078,280	15,710,086	18.0	13.2
2. Netherlands	78,408	7,784,171	26.9	1.0
3. France	263,087	6,750,755	34.6	3.8
4. Brazil	507,460	4,698,488	40.0	10.8
5. Australia	303,787	4,100,009	44.7	7.4
6. Canada	667,951	3,985,554	49.3	16.7
7. Germany, Federal Republic of	132,799	3,613,706	53.4	3.6
8. Denmark	37,020	2,789,974	56.6	1.3
9. Belgium-Luxembourg	43,551	2,755,844	59.8	1.5
10. Argentina	204,713	2,454,751	62.6	8.3
11. Italy	66,105	2,144,530	65.1	3.0
12. United Kingdom	15,197	1,859,383	67.2	.8
Rest of world	2,386,426	28,567,090	32.7	8.3
Total	6,784,784	87,214,341	100.0	7.7

[1] Total number of suppliers to world; 101.

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[33] This same sort of exercise, where the elasticity of non-cartel supply depended both on the cartel's share of exports to CMEA and their share of total world exports, was done for all of the commodity groups simulated. However, the underlying data are not shown for the other commodities in order to conserve space.

The last column at the bottom of table 3 shows the elasticity of CMEA demand for food and live animal imports from the cartel under the various assumptions. It is calculated from equations (1) and (2) in Section III. Tables similar to table 3 for the other commodity simulations are contained in Appendix 2.

The import demand elasticities and the underlying trade data were used to simulate some of the economic costs and benefits of a hypothetical regime of export controls which raised cartel export prices to CMEA by ten percent. For the sake of brevity, two import demand elasticities were selected for each commodity group. The elasticities chosen were best *guesses* for a cartel composed of the top four and top seven (in one case, the top eight) Western exporters to CMEA, respectively. Since the authors claim no special knowledge of Western trade with CMEA in these commodity groups, the elasticity selections and the subsequent calculations should be considered merely illustrative. If the model were ever used for actual policy analysis, it would be necessary to draw on the expertise of specialists to select elasticity estimates.

The illustrative cost/benefit simulations for selected commodity groups are shown in table 5. Five one-digit commodity groups were chosen to get a rough indication both of the importance of trade within these categories and of the potential for a cartel to contol exports in each group. Four of the one-digit groups in table 5 were selected because they were important or interesting as examples of cases in which cartelization might be possible (e.g., SITCs 0, 5, 6, and 7) and one because cartelization appears unlikely (SITC 1, see also appendix table A-1 for a detailed view of trade in SITC 1). Some of the one-digit categories were further decomposed into two and three-digit groups, corresponding to food and high-technology goods. Two sets of calculations were made for each commodity group: the first refers to a four-member cartel and the second to a seven-country coalition. The model underlying the calculations is shown graphically in Appendix 1.

TABLE 5.—SIMULATED EFFECTS OF A 10-PERCENT EXPORT PRICE INCREASE

[Values in thousands of dollars]

SITC	Elasticity of demand for cartel exports	Damage to targeted importers	Cartel's terms of trade gain	Cartel's adjustment costs	Employment impact (job opportunities)		Net cost to cartel(4) − (3)	Benefit-cost ratio (2)/(7)
					Direct	Total		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
0 Food and live animals	0.9	339,789	323,778	320,220	3,200	12,800	[1] −3,558	([2])
	.4	422,968	414,336	172,640	1,700	6,900	[1] −241,696	([2])
1 Beverages and tobacco	7.7	13,223	4,945	165,550	1,700	6,600	160,605	0.1
	3.1	24,336	19,872	89,280	900	3,600	69,408	.4
5 Chemicals	2.8	137,170	114,840	446,600	3,600	13,400	331,760	.4
	1.6	204,240	186,480	355,200	2,800	10,700	168,720	1.2
6 Basic manufactures	1.9	451,052	403,704	946,960	23,700	47,400	543,256	.8
	1.6	598,184	546,168	1,040,320	26,000	52,000	494,152	1.2
7 Machines, transport equipment	1.9	518,384	463,968	1,088,320	21,800	54,400	624,352	.8
	.8	749,184	717,968	624,320	12,500	31,200	[1] −93,648	([2])
01 Meat and preparations	2.1	9,308	8,216	21,840	200	1,200	13,624	.7
	1.8	12,376	11,152	24,480	200	1,400	13,328	.9
04 Cereals and preparations	.3	299,736	295,171	91,290	800	3,100	[1] −203,881	([2])
	.2	331,254	327,908	66,920	600	2,300	[1] −260,988	([2])
041 Wheat etc. unmilled	1.0	107,730	102,060	113,400	1,000	3,800	11,340	9.5
	.8	125,472	120,244	104,560	900	3,600	[1] −15,684	([2])
044 Maize unmilled	.8	144,768	138,736	120,640	1,100	4,100	[1] −18,096	([2])
	.8	148,032	141,864	123,360	1,100	4,200	[1] −18,504	([2])
71 Machinery, nonelectric	3.0	350,115	288,330	1,235,700	24,700	49,400	947,370	.4
	1.5	496,448	456,195	805,050	16,100	32,200	348,855	1.4
72 Electrical machinery	1.7	78,599	71,297	146,030	3,700	7,300	74,733	1.1
	1.3	104,440	97,179	145,210	3,600	7,200	48,031	2.2
73 Transport equipment	1.1	114,251	107,601	132,990	1,300	5,300	25,389	4.5
	.8	153,312	146,924	127,760	1,300	5,100	[1] −19,164	([2])
861 Instruments, apparatus	2.3	16,196	14,091	42,090	1,100	2,500	27,999	.6
	1.6	21,528	19,656	37,440	900	2,200	17,784	1.2

[1] In cases of inelastic import demand the cartel's terms of trade gains exceed its adjustment costs and the cartel incurs no net cost. The corresponding benefit/cost ratio in column (8) is defined as infinity.

[2] Infinite.

Column 1 in table 5 reports two values of the import demand elasticities corresponding to a four- and a seven-county cartel for each commodity group. Column 2 shows the impact on CMEA of a ten percent increase in the price of cartel exports. For example, a ten percent increase in the price of the cartel's exports of food and live animals would impose between $340 and $420 million worth of damage on CMEA. Column 3 shows that in this case the cartel's terms of trade would improve by roughly $320 to $415 million. At the same time, as column 4 indicates, the value of cartel resources displaced in the short run would be roughly $320 to $172 million. Most of this cost to the cartel would be temporary. It would decline over time as displaced resources found new employment. Since the model is static and does not determine the time path of adjustment, the adjustment costs in column 4 should be interpreted as the cost in the first year.

Columns 5 and 6 translate the assumed decline in cartel production and exports into a hypothetical impact on employment opportunities. These calculations were made using the Department of Labor's model of trade and employment.[34] Returning to the case of a ten percent price increase for exports in SITC 0, the reduction in cartel exports would cause demand for labor to fall by roughly 3,200 to 1,700 job opportunities directly in the Food and Live Animals sector. The total demand for labor in both the Food and Live Animals sector and in all of the other sectors which sell goods or services to it would fall by 12,800 to 6,900 job opportunities.

Several caveats are in order. The trade and employment model used to calculate employment impacts is for the U.S. economy in 1976. Thus, it may over- or underestimate the employment impact for other Western countries. It is implicitly assumed that all countries have the same production and adjustment costs, although as is argued in Section III, this is hardly likely to be true. Moreover, the employment model holds wages, prices and macroeconomic conditions constant. These assumptions generally, but not always, will cause the model to overestimate the likely employment impact. For these reasons, the employment effects shown should be taken as very crude orders of magnitude.

In column 7 the net costs of the hypothetical controls are calculated by subtracting the cartel's adjustment costs from its terms of trade gains. Not surprisingly, in cases where CMEA's demand for cartel exports is assumed to be inelastic and the cartel imposes less than prohibitive export controls, the cartel's terms of trade gains exceed the adjustment costs. In certain cases it may be realistic to consider a less than complete elimination of cartel exports to the targeted countries. The advantage of a partial embargo is that the cartel can at least partly offset its adjustment costs with terms of trade gains. However, in cases where the policy objective is to delay or limit the development of strategic or military capabilities in targeted countries, a complete prohibition of exports may be desirable. This is a much more costly strategy because there will be no terms of trade gains.

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[34] See Bayard, Orr, Pelzman and Perez-Lopez (1982) for a description of the model and its limitations.

Column 8 in table 5 summarizes the calculations. The ratio of the damage imposed on CMEA (a benefit to the export cartel) to the net cost (column 4 minus column 3) to the cartel is shown for each commodity group. The higher the benefit/cost ratio, the more economic damage the cartel can inflict for every dollar in costs that the cartel incurs. No judgement is made as to whether this ratio must exceed unity for controls to be at least economically feasible. That is essentially a political judgement.

Moreover, column 8 is somewhat misleading because we have not included the costs of organizing, policing and enforcing the cartel. There are several ways in which these costs could be estimated, but no attempt has been made here to estimate them. Including administrative costs would clearly lower the benefit/cost ratios shown in column 8.

The model developed here may be useful to calculate the economic costs and benefits of export controls. Some of its applications have been illustrated by simulating some of the economic costs and benefits of hypothetical export controls. By themselves, these calculations have no immediate policy application. If the model were to be used in actual policy analysis, very careful judgements would have to be made about the elasticities underlying the model, the feasibility of inducing various countries to join the cartel and, most importantly, whether the imposition of economic costs of targeted importers is likely to be effective in achieving political objectives. These judgements are left to others with more competence or willingness to make them.

APPENDIX 1: THE MODEL

The assumptions underlying the model and the calculations are shown, for two cases, in figures 1 and 2. In both cases, and all of the calculations shown in the text, it was assumed that the cartel raised prices only to targeted importers. In the first case it is assumed that cartel export supply is perfectly elastic and cartel exports are imperfect substitutes for non-cartel exports and goods produced within the importing countries. Demand for cartel exports in the targeted countries is Dx. Initially, cartel supply is Sx. When the cartel restricts exports from Qo to Q1, export prices rise from Po to P1. Areas A plus B measure the damage inflicted on importers. It is what they would be willing to pay to avoid the imposition of controls. Area A is the cartel's terms of trade gain. Of course, there is no terms of trade gain for the cartel if exports are completely prohibited.

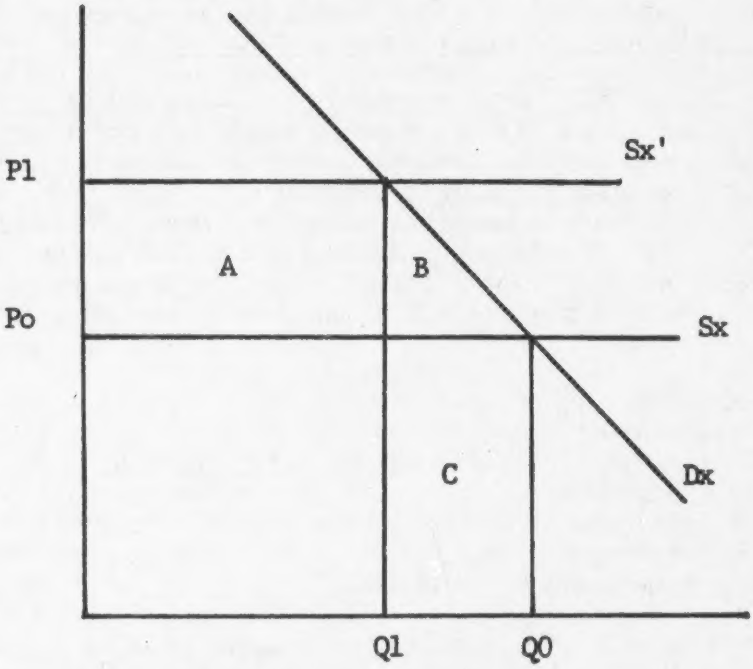
P1
Po
Sx'
Sx
Dx
A
B
C
Q1
Q0

Figure 1: Perfectly Elastic Cartel Supply

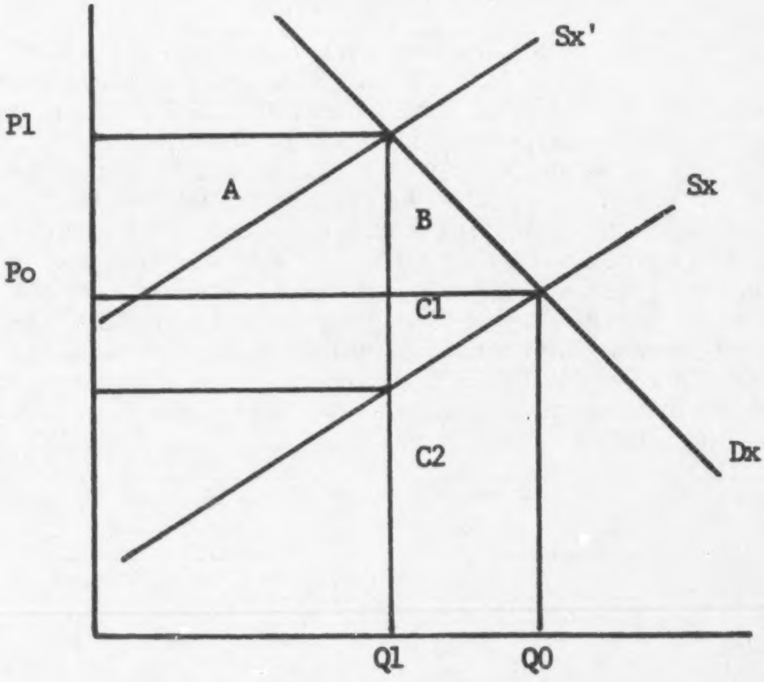
P1
Po
Sx'
Sx
Dx
A
B
C1
C2
Q1
Q0

Figure 2: Less Than Perfectly Elastic Supply

Area C is taken to measure the short run social costs of adjustment, on the assumption that wages and prices are fixed in the exporting countries and that these resources are involuntarily displaced. [See Leamer (1980) for a somewhat different model, with considerably lower adjustment costs.] In the short run, resources are assumed to be immobile. Over time, they find reemployment and social adjustment costs will decline.

In the second case, cartel supply is assumed to be less than perfectly elastic, but the imperfect substitutes assumption still holds. The major difference in this case is that adjustment costs include areas C1 and C2. Area C1 is a loss of "profits" (really, economic rents) to producers of exports because domestic prices fall when exports decline. Area C2 is the value of resources displaced. In this case, there are additional private producer losses due to lower prices in the home market, but they are offset by either domestic consumer gains, or terms of trade gains and do not constitute social costs. [See Mutti (1977) for more discussion of private vs. social costs.] For certain policy purposes it may be useful to calculate both social and private costs. Private costs may influence domestic opposition to controls and in some cases it may be necessary or desirable to compensate for these losses. However, the simulations presented here focus solely on social costs. The calculations assume perfectly elastic export supply and implicitly lump areas C1 and C2 together as area C.

APPENDIX 2

TABLE A1.—SITC 1: BEVERAGES AND TOBACCO; TOP 10 SUPPLIERS TO CMEA, AND THEIR EXPORTS TO CMEA, U.S.S.R., AND WORLD[1]

[Values in thousands of dollars]

	CMEA	U.S.S.R.	World	Cumulative percent supply to CMEA	Percent CMEA of world
1. Algeria	80,649	78,910	98,362	21.3	82.0
2. Greece	55,845	26,594	216,871	36.1	25.8
3. Yugoslavia	43,232	22,685	119,341	47.5	36.2
4. Turkey	35,465	18,601	253,219	56.8	14.0
5. India	31,848	28,859	110,049	65.2	28.9
6. Spain	22,593	10,365	292,042	71.2	7.7
7. France	17,956	4,773	1,431,208	76.0	1.3
8. Egypt	15,260	13,830	15,679	80.0	97.3
9. United States	13,754	1,137	1,523,503	83.6	.9
10. Portugal	8,899	8,781	121,489	86.0	7.3
Rest of world	53,113	15,782	4,026,682	14.0	1.3
Total	378,614	230,317	8,208,445	100.0	4.6

[1] Total number of suppliers to CMEA, 34.

CALCULATION OF ELASTICITY OF DEMAND FOR CARTEL EXPORTS—VARIOUS CASES (TABLE A1.—SITC 1)

	Import share controlled by cartel	Target countries' import demand elasticity	Elasticity of substitution	Elasticity of noncartel supply	Elasticity of demand for cartel exports
Top N Countries in cartel:					
4	0.57	0.1	0	0	0
			3	3	0.9
			1,000,000	10	7.7
4	0.57	0.8	0	0	0
			3	3	1.5
			1,000,000	10	8.9
4	.57	1.6	0	0	0
			3	3	2.1
			1,000,000	10	10.4
7	.76	.1	0	0	0
			3	1	0.3
			1,000,000	3	1.1
7	.76	.8	0	0	0
			3	1	1.1
			1,000,000	3	2.0
7	.76	1.6	0	0	0
			3	1	1.8
			1,000,000	3	3.1

TABLE A2.—SITC 5: CHEMICALS: TOP 10 SUPPLIERS TO CMEA, AND THEIR EXPORTS TO CMEA, U.S.S.R., AND WORLD [1]

[Values in thousands of dollars]

	CMEA	U.S.S.R.	World	Cumulative percent supply to CMEA	Percent CMEA of world
1. Germany, Federal Republic of	811,671	219,578	12,532,201	25.6	6.5
2. France	318,503	142,320	5,526,972	35.6	5.8
3. United Kingdom	245,727	89,260	5,468,320	43.4	4.5
4. Netherlands	218,790	40,949	5,999,954	50.3	3.6
5. Switzerland	212,968	33,059	3,145,125	57.0	6.8
6. Italy	209,745	64,638	2,877,428	63.6	7.3
7. Japan	202,823	149,840	3,746,310	70.0	5.4
8. Austria	197,990	32,730	651,643	76.2	30.4
9. Yugoslavia	188,871	115,178	353,358	82.2	53.5
10. Belgium-Luxembourg	155,168	24,294	4,025,839	87.1	3.9
Rest of world	409,416	196,219	17,366,743	12.9	2.4
Total	3,171,672	1,108,065	61,693,893	100.0	5.1

[1] Total number of suppliers to CMEA, 43.

CALCULATION OF ELASTICITY OF DEMAND FOR CARTEL EXPORTS—VARIOUS CASES (TABLE A2.—SITC 5)

	Import share controlled by cartel	Target countries' import demand elasticity	Elasticity of substitution	Elasticity of non-cartel supply	Elasticity of demand for cartel exports
Top N countries in cartel:					
4	0.50	0.7	0	0	0
			3	3	1.6
			1,000,000	5	6.4
4	.50	1.3	0	0	0

CALCULATION OF ELASTICITY OF DEMAND FOR CARTEL EXPORTS—VARIOUS CASES (TABLE A2.—SITC 5)—Continued

	Import share controlled by cartel	Target countries' import demand elasticity	Elasticity of substitution	Elasticity of non-cartel supply	Elasticity of demand for cartel exports
			3	3	2.0
			1,000,000	5	7.6
4	.50	2.6	0	0	0
			3	3	2.8
			1,000,000	5	10.2
7	.70	.7	0	0	0
			3	1	1.1
			1,000,000	2	1.9
7	.70	1.3	0	0	0
			3	1	1.6
			1,000,000	2	2.7
7	.70	2.6	0	0	0
			3	1	2.7
			1,000,000	2	4.6

TABLE A3.—SITC 6: BASIC MANUFACTURES; TOP 10 SUPPLIERS TO CMEA, AND THEIR EXPORTS TO CMEA, U.S.S.R, AND WORLD [1]

[Values in thousands of dollars]

	CMEA	U.S.S.R.	World	Cumulative percent supply to CMEA	Percent CMEA of world
1. Germany, Federal Republic of	2,026,336	903,478	20,723,312	23.0	9.8
2. Japan	1,471,066	1,248,693	18,864,800	39.7	7.8
3. Italy	826,021	514,341	8,468,167	49.0	9.8
4. France	660,703	316,016	11,360,020	56.5	5.8
5. Yugoslavia	581,216	207,862	1,336,845	63.1	43.5
6. Austria	488,704	72,695	3,043,168	68.7	16.1
7. Finland	447,741	367,344	2,514,285	73.7	17.8
8. Belgium-Luxembourg	384,641	210,016	11,421,214	78.1	3.4
9. United Kingdom	278,750	86,663	10,395,935	81.3	2.7
10. Sweden	261,154	65,924	4,576,094	84.2	5.7
Rest of world	1,390,524	606,529	48,261,678	15.8	2.9
Total	8,816,856	4,599,561	140,965,518	100.0	6.3

[1] Total number of suppliers to CMEA, 54.

CALCULATION OF ELASTICITY OF DEMAND FOR CARTEL EXPORTS—VARIOUS CASES (TABLE A3.—SITC 6)

	Import share controlled by cartel	Target countries' import demand elasticity	Elasticity of substitution	Elasticity of non-cartel supply	Elasticity of demand for cartel exports
Top N countries in cartel:					
4	0.57	0.7	0	0	0
			3	3	1.8
			1,000,000	10	8.8
4	.57	1.3	0	0	0
			3	3	1.9
			1,000,000	10	9.8
4	.57	2.6	0	0	0
			3	3	2.8
			1,000,000	10	12.1

CALCULATION OF ELASTICITY OF DEMAND FOR CARTEL EXPORTS—VARIOUS CASES (TABLE A3.—SITC 6)—Continued

	Import share controlled by cartel	Target countries' import demand elasticity	Elasticity of substitution	Elasticity of non-cartel supply	Elasticity of demand for cartel exports
7	.74	.7	0	0	0
			3	2	1.1
			1,000,000	5	2.7
7	.74	1.3	0	0	0
			3	2	1.6
			1,000,000	5	3.5
7	.74	2.6	0	0	0
			3	2	2.7
			1,000,000	5	5.3

TABLE A4.—SITC 7: MACHINES, TRANSPORT EQUIPMENT; TOP 10 SUPPLIERS TO CMEA, AND THEIR EXPORTS TO CMEA, U.S.S.R. AND WORLD[1]

[Values in thousands of dollars]

	CEMA	U.S.S.R.	World	Cumulative percent supply to CMEA	Percent CMEA of world
1. Germany, Federal Republic of	2,814,337	1,397,364	48,527,120	27.7	5.8
2. France	1,231,751	410,688	20,924,816	39.8	5.9
3. Japan	917,791	681,731	35,917,184	48.9	2.6
4. United States	764,489	606,263	49,501,168	56.4	1.5
5. Finland	709,438	641,957	1,576,016	63.4	45.0
6. Italy	700,066	358,258	12,730,405	70.3	5.5
7. Yugoslavia	666,350	419,641	1,362,887	76.8	48.9
8. United Kingdom	475,209	204,653	18,175,344	81.5	2.6
9. Switzerland	431,271	153,364	4,990,285	85.8	8.6
10. Sweden	404,150	166,365	8,152,572	89.7	5.0
Rest of world	1,042,152	316,022	45,252,223	10.3	2.3
Total	10,157,004	5,356,306	247,110,020	100.0	4.1

[1] Total number of suppliers to CMEA, 43.

CALCULATION OF ELASTICITY OF DEMAND FOR CARTEL EXPORTS—VARIOUS CASES (TABLE A4.—SITC 7)

	Import share controlled by cartel	Target countries' import demand elasticity	Elasticity of substitution	Elasticity of noncartel supply	Elasticity of demand for cartel exports
Top N countries in cartel:					
4	0.56	0.5	0	0	0
			3	3	1.3
			1,000,000	10	8.8
4	.56	1.3	0	0	0
			3	3	1.9
			1,000,000	10	10.2
4	.56	2.6	0	0	0
			3	3	2.8
			1,000,000	10	12.5
7	.77	.5	0	0	0
			3	2	.8
			1,000,000	5	2.1
7	.77	1.3	0	0	0
			3	2	1.6

CALCULATION OF ELASTICITY OF DEMAND FOR CARTEL EXPORTS—VARIOUS CASES (TABLE A4.—SITC 7)—Continued

	Import share controlled by cartel	Target countries' import demand elasticity	Elasticity of substitution	Elasticity of noncartel supply	Elasticity of demand for cartel exports
			1,000,000	5	3.2
7	.77	2.6	0	0	0
			3	2	2.7
			1,000,000	5	4.9

TABLE A5.—SITC 01: MEAT AND PREPARATIONS; TOP 10 SUPPLIERS TO CMEA, AND THEIR EXPORTS TO CMEA, U.S.S.R., AND WORLD [1]

[Values in thousands of dollars]

	CMEA	U.S.S.R.	World	Cumulative percent supply to CMEA	Percent CMEA of world
1. New Zealand	40,581	40,581	673,194	23.8	6.0
2. France	27,969	15,368	740,585	40.2	3.8
3. Finland	19,411	16,938	20,269	51.5	95.8
4. Australia	15,996	11,224	934,958	60.9	1.7
5. Germany, Federal Republic of	11,723	5,271	453,415	67.8	2.6
6. Yugoslavia	10,241	6,892	197,859	73.8	5.2
7. Netherlands	9,896	9,391	1,644,034	79.6	.6
8. Argentina	9,598	9,159	523,432	85.2	1.8
9. Somalia	6,128	6,128	6,835	88.8	89.7
10. Belgium-Luxembourg	5,347	4,456	602,029	91.9	.9
Rest of world	13,827	7,840	3,499,544	8.1	.4
Total	170,717	133,248	9,296,154	100.0	1.8

[1] Total number of suppliers to CMEA, 24.

CALCULATION OF ELASTICITY OF DEMAND FOR CARTEL EXPORTS—VARIOUS CASES (TABLE A5.—SITC 01)

	Import share controlled by cartel	Target countries' import demand elasticity	Elasticity of substitution	Elasticity of noncartel supply	Elasticity of demand for cartel exports
Top N countries in cartel:					
4	0.61	0.1	0	0	0
			3	3	.8
			1,000,000	10	6.6
4	.61	.8	0	0	0
			3	3	1.4
			1,000,000	10	7.7
4	.61	1.6	0	0	0
			3	3	2.1
			1,000,000	10	9.0
7	.80	.1	0	0	0
			3	2	.4
			1,000,000	5	1.4
7	.80	.8	0	0	0
			3	2	1.1
			1,000,000	5	2.3
7	.80	1.6	0	0	0
			3	2	1.8
			1,000,000	5	3.3

TABLE A6.—SITC 04: CEREALS AND PREPARATIONS; TOP 10 SUPPLIERS TO CMEA, AND THEIR EXPORTS TO CMEA, U.S.S.R, AND WORLD [1]

[Values in thousands of dollars]

	CMEA	U.S.S.R.	World	Cumulative percent supply to CMEA	Percent CMEA of world
1. United States	1,915,002	1,346,938	10,910,926	53.3	17.6
2. Canada	659,016	471,802	2,610,694	71.6	25.2
3. Australia	285,580	280,642	1,746,426	79.6	16.4
4. Argentina	183,613	148,182	1,215,511	84.7	15.1
5. France	151,794	46,792	2,398,093	88.9	6.3
6. Sweden	82,479	504	192,445	91.2	42.9
7. Germany, Federal Republic of	68,607	15,435	593,271	93.1	11.6
8. Brazil	60,249	54,906	190,466	94.8	31.6
9. Egypt	58,112	26,565	80,512	96.4	72.2
10. Yugoslavia	57,320	30,058	102,508	98.0	55.9
Rest of world	70,778	27,538	2,770,817	2.0	2.6
Total	3,592,560	2,449,362	22,811,669	100.0	15.7

[1] Total number of suppliers to CMEA, 28.

CALCULATION OF ELASTICITY OF DEMAND FOR CARTEL EXPORTS—VARIOUS CASES (TABLE A6.—SITC 04)

	Import share controlled by cartel	Target countries; import demand elasticity	Elasticity of substitution	Elasticity of noncartel supply	Elasticity of demand for cartel exports
Top in countries in cartel:					
4	0.85	0.1	0	0	0
			3	3	.3
			1,000,000	5	1.0
4	0.85	.8	0	0	0
			3	3	1.0
			1,000,000	5	1.8
4	0.85	1.6	0	0	0
			3	3	1.8
			1,000,000	5	2.8
7	0.93	.1	0	0	0
			3	1	.2
			1,000,000	3	.3
7	0.93	.8	0	0	0
			3	1	.9
			1,000,000	3	1.1
7	0.93	1.6	0	0	0
			3	1	1.7
			1,000,000	3	1.9

TABLE A7.—SITC 041: WHEAT ETC. UNMILLED: TOP 10 SUPPLIERS TO CMEA, AND THEIR EXPORTS TO CMEA, U.S.S.R. AND WORLD [1]

[values in thousands of dollars]

	CMEA	U.S.S.R.	World	Cumulative percent supply to CMEA	Percent CMEA of world
1. Canada	451,752	318,169	1,732,748	34.0	26.1
2. United States	420,146	249,985	3,878,710	65.6	10.8
3. Australia	144,608	142,002	1,128,048	76.5	12.8
4. Argentina	117,676	116,520	431,491	85.3	27.3
5. Sweden	72,867	221	110,329	90.8	66.0

TABLE A7.—SITC 041: WHEAT ETC. UNMILLED: TOP 10 SUPPLIERS TO CMEA, AND THEIR EXPORTS TO CMEA, U.S.S.R. AND WORLD [1]—Continued

[values in thousands of dollars]

	CMEA	U.S.S.R.	World	Cumulative percent supply to CMEA	Percent CMEA of world
6. France	70,101	0	1,141,095	96.1	6.1
7. Germany, Federal Republic of	30,182	33	150,019	98.4	20.1
8. Austria	8,385	0	12,728	99.0	65.9
9. Finland	7,043	0	22,807	99.5	30.9
10. Belgium-Luxembourg	3,528	0	120,062	99.8	2.9
Rest of World	2,885	637	171,584	0.2	1.7
Total	1,329,173	827,567	8,899,621	100.0	14.9

[1] Total number of suppliers to CMEA, 14.

CALCULATION OF ELASTICITY OF DEMAND FOR CARTEL EXPORTS—VARIOUS CASES (TABLE A7.—SITC 04)

	Import share controlled by cartel	Target countries' import demand elasticity	Elasticity of substitution	Elasticity of non-cartel supply	Elasticity of demand for cartel exports
Top in countries in cartel:					
4	0.85	0.1	0	0	0
			3	2	.3
			1,000,000	4	.8
4	.85	.8	0	0	0
			3	2	1.0
			1,000,000	4	1.6
4	.85	1.6	0	0	0
			3	2	1.8
			1,000,000	4	2.6
7	.98	.1	0	0	0
			3	1	.1
			1,000,000	2	.1
7	.98	.8	0	0	0
			3	1	.8
			1,000,000	2	.9
7	.98	1.6	0	0	0
			3	1	1.6
			1,000,000	2	1.7

TABLE A8.—SITC 044: MAIZE UNMILLED; TOP 10 SUPPLIERS TO CMEA, AND THEIR EXPORTS TO CMEA, U.S.S.R. AND WORLD[1]

[Values in thousands of dollars]

	CEMA	U.S.S.R.	World	Cumulative percent supply to CMEA	Percent CMEA of world
1. United States	1,370,500	1,078,364	5,223,493	88.8	26.2
2. Brazil	54,954	54,906	170,158	92.4	32.3
3. Yugoslavia	51,083	29,852	90,908	95.7	56.2
4. Argentina	31,662	31,662	362,685	97.8	8.7
5. Canada	28,351	28,350	46,157	99.6	61.4
6. France	5,482	2	336,163	100.0	1.6
7. Germany, Federal Republic of	401	168	61,268	100.0	.7
8. Netherlands	50	0	372,242	100.0	0
9. Italy	27	0	820	100.0	3.3
10. Switzerland	23	0	199	100.0	11.6

TABLE A8.—SITC 044: MAIZE UNMILLED; TOP 10 SUPPLIERS TO CMEA, AND THEIR EXPORTS TO CMEA, U.S.S.R. AND WORLD[1]—Continued

[Values in thousands of dollars]

	CEMA	U.S.S.R.	World	Cumulative percent supply to CMEA	Percent CMEA of world
Rest of world	0	0	0	0.0	0
Total	1,542,533	1,223,304	6,664,093	100.0	23.1

[1] Total number of suppliers to CMEA, 10.

CALCULATION OF ELASTICITY OF DEMAND FOR CARTEL EXPORTS—VARIOUS CASES (TABLE A8.—SITC 044)

	Import share controlled by cartel	Target countries' import demand elasticity	Elasticity of substitution	Elasticity of noncartel supply	Elasticity of demand for cartel exports
Top N countries in cartel:					
4	0.98	0.1	0	0	0
			3	2	.1
			1,000,000	4	.2
4	.98	.8	0	0	0
			3	2	.8
			1,000,000	4	.9
4	.98	1.6	0	0	0
			3	2	1.6
			1,000,000	4	1.7
7	1.00	.1	0	0	0
			3	1	.1
			1,000,000	2	.1
7	1.00	.8	0	0	0
			3	1	.8
			1,000,000	2	.8
7	1.00	1.6	0	0	0
			3	1	1.6
			1,000,000	2	1.6

TABLE A9.—SITC 71: MACHINERY, NONELECTRIC; TOP 10 SUPPLIERS TO CMEA, AND THEIR EXPORTS TO CMEA, U.S.S.R., AND WORLD[1]

[Values in thousands of dollars]

	CMEA	U.S.S.R.	World	Cumulative percent supply to CMEA	Percent CMEA of world
1. Germany, Federal Republic of	2,098,955	1,013,637	22,280,416	30.7	9.4
2. France	783,226	347,671	7,862,125	42.2	10.0
3. United States	625,710	522,518	22,012,288	51.4	2.8
4. Japan	611,193	474,313	7,767,947	60.3	7.9
5. Italy	571,559	331,260	6,042,283	68.7	9.5
6. Switzerland	358,533	145,211	3,429,713	74.0	10.5
7. United Kingdom	318,170	123,142	8,977,624	78.6	3.5
8. Finland	298,213	238,023	655,914	83.0	45.5
9. Austria	268,242	70,849	1,221,810	86.9	22.0
10. Sweden	263,342	114,119	3,116,005	90.8	8.5
Rest of world	629,056	251,876	12,583,906	9.2	5.0
Total	6,826,199	3,632,619	95,950,031	100.0	7.1

[1] Total number of suppliers to CMEA, 31.

CALCULATION OF ELASTICITY OF DEMAND FOR CARTEL EXPORTS—VARIOUS CASES (TABLE A9.—SITC 71)

	Import share controlled by cartel	Target countries' import demand elasticity	Elasticity of substitution	Elasticity of non-cartel supply	Elasticity of demand for cartel exports
Top N countries in cartel:					
4	0.60	0.8	0	0	0
			3	2	1.4
			1,000,000	4	4.0
4	.60	1.0	0	0	0
			3	2	1.6
			1,000,000	4	4.3
4	.60	3.0	0	0	0
			3	2	3.0
			1,000,000	4	7.7
7	.79	.8	0	0	0
			3	1	1.0
			1,000,000	2	1.5
7	.79	1.0	0	0	0
			3	1	1.2
			1,000,000	2	1.8
7	.79	3.0	0	0	0
			3	1	3.0
			1,000,000	2	4.3

TABLE A10.—SITC 72: ELECTRICAL MACHINERY; TOP 10 SUPPLIERS TO CMEA, AND THEIR EXPORTS TO CMEA, U.S.S.R. AND WORLD[1]

[Values in thousands of dollars]

	CMEA	U.S.S.R.	World	Cumulative percent supply to CMEA	Percent CMEA of world
1. Germany, Federal Republic of	338,384	111,001	9,410,010	22.3	3.6
2. France	205,200	55,721	4,006,508	35.8	5.1
3. Yugoslavia	188,912	124,252	395,630	48.2	47.7
4. Japan	126,814	69,148	9,609,430	56.5	1.3
5. Sweden	91,655	46,999	1,717,762	62.5	5.3
6. Italy	83,564	21,674	2,602,620	68.0	3.2
7. United States	82,163	54,108	9,278,488	73.4	.9
8. United Kingdom	78,122	26,745	3,596,848	78.6	2.2
9. Switzerland	69,504	7,945	1,386,643	83.2	5.0
10. Austria	62,773	13,929	763,691	87.3	8.2
Rest of world	193,288	104,572	10,435,222	12.7	1.9
Total	1,520,379	636,094	53,202,852	100.0	2.9

[1] Total number of suppliers to CMEA, 38.

CALCULATION OF ELASTICITY OF DEMAND FOR CARTEL EXPORTS—VARIOUS CASES (TABLE A10.—SITC 72)

	Import share controlled by cartel	Target countries' import demand elasticity	Elasticity of substitution	Elasticity of noncartel supply	Elasticity of demand for cartel exports
Top N countries in cartel:					
4	0.57	0.7	0	0	0
			3	3	1.4
			1,000,000	5	5.0
4	.57	1.0	0	0	0

CALCULATION OF ELASTICITY OF DEMAND FOR CARTEL EXPORTS—VARIOUS CASES (TABLE A10.—SITC 72)—Continued

	Import share controlled by cartel	Target countries' import demand elasticity	Elasticity of substitution	Elasticity of noncartel supply	Elasticity of demand for cartel exports
			3	3	1.7
			1,000,000	5	5.5
4	.57	5.4	0	0	0
			3	3	4.2
			1,000,000	5	13.2
7	.73	.7	0	0	0
			3	1	1.0
			1,000,000	2	1.7
7	.73	1.0	0	0	0
			3	1	1.3
			1,000,000	2	2.1
7	.73	5.4	0	0	0
			3	1	4.5
			1,000,000	2	8.1

TABLE A11.—SITC 73: TRANSPORT EQUIPMENT; TOP 10 SUPPLIERS TO CMEA, AND THEIR EXPORTS TO CMEA, U.S.S.R., AND WORLD [1]

[Values in thousands of dollars]

	CMEA	U.S.S.R.	World	Cumulative percent supply to CMEA	Percent CMEA of world
1. Germany, Federal Republic of	376,998	272,726	16,836,672	20.8	2.2
2. Finland	351,875	349,848	657,314	40.3	53.5
3. France	243,326	7,296	9,056,182	53.7	2.7
4. Yugoslavia	236,296	145,857	561,410	66.8	42.1
5. Japan	179,784	138,269	18,539,808	76.7	1.0
6. United Kingdom	78,918	54,766	5,600,876	81.0	1.4
7. Austria	73,029	24,316	380,761	85.1	19.2
8. United States	56,617	29,637	18,210,384	88.2	.3
9. Sweden	49,153	5,247	3,318,806	90.9	1.5
10. Italy	44,944	5,324	4,085,502	93.4	1.1
Rest of world	119,479	54,302	19,460,221	6.6	.6
Total	1,810,419	1,087,588	96,707,936	100.0	1.9

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[1] Total number of suppliers to CMEA, 31.

CALCULATION OF ELASTICITY OF DEMAND FOR CARTEL EXPORTS—VARIOUS CASES (TABLE A11.—SITC 73)

	Import share controlled by cartel	Target countries' import demand elasticity	Elasticity of substitution	Elasticity of non-cartel supply	Elasticity of demand for cartel exports
Top N countries in cartel:					
4	0.67	0.5	0	0	0
			3	3	1.1
			1,000,000	5	3.2
4	.67	3.0	0	0	0
			3	3	3.0
			1,000,000	5	6.9
4	.67	6.0	0	0	0
			3	3	4.7
			1,000,000	5	11.4

CALCULATION OF ELASTICITY OF DEMAND FOR CARTEL EXPORTS—VARIOUS CASES (TABLE A11.—SITC 73)—Continued

	Import share controlled by cartel	Target countries' import demand elasticity	Elasticity of substitution	Elasticity of non-cartel supply	Elasticity of demand for cartel exports
8	.88	.5	0	0	0
			3	1	.6
			1,000,000	2	.8
8	.88	3.0	0	0	0
			3	1	3.0
			1,000,000	2	3.7
8	.88	6.0	0	0	0
			3	1	5.4
			1,000,000	2	7.1

TABLE A12.—SITC 861: INSTRUMENTS, APPARATUS; TOP 10 SUPPLIERS TO CMEA, AND THEIR EXPORTS TO CMEA, U.S.S.R., AND WORLD [1]

[Values in thousands of dollars]

	CMEA	U.S.S.R.	World	Cumulative percent supply to CMEA	Percent CMEA of world
1. Germany, Federal Republic of	99,839	41,110	1,982,988	36.2	5.0
2. United Kingdom	34,736	15,693	760,076	48.8	4.6
3. France	25,364	9,590	600,147	58.0	4.2
4. Switzerland	22,800	5,012	428,347	66.2	5.3
5. Japan	22,022	14,849	1,858,963	74.2	1.2
6. United States	17,201	8,159	1,950,859	80.5	.9
7. Italy	11,555	5,434	312,117	84.6	3.7
8. Sweden	9,437	4,740	189,167	88.1	5.0
9. Netherlands	8,493	696	634,198	91.1	1.3
10. Austria	7,783	1,326	75,832	94.0	10.3
Rest of world	16,660	3,768	738,000	6.0	2.3
Total	275,890	110,377	9,530,694	100.0	2.9

[1] Total number of suppliers to CMEA, 28.

CALCULATION OF ELASTICITY OF DEMAND FOR CARTEL EXPORTS—VARIOUS CASES (TABLE A12.—SITC 861)

	Import share controlled by cartel	Target countries' import demand elasticity	Elasticity of subtitution	Elasticity of noncartel supply	Elasticity of demand for cartel exports
Top N countries in cartel:					
4	0.66	0.5	0	0	0
			3	3	1.1
			1,000,000	5	3.3
4	.66	1.1	0	0	0
			3	3	1.6
			1,000,000	5	4.2
4	.66	2.0	0	0	0
			3	3	2.3
			1,000,000	5	5.6
7	.85	.5	0	0	0
			3	1	.7
			1,000,000	2	.9
7	.85	1.1	0	0	0
			3	1	1.3
			1,000,000	2	1.6

CALCULATION OF ELASTICITY OF DEMAND FOR CARTEL EXPORTS—VARIOUS CASES (TABLE A12.—SITC 861)—Continued

	Import share controlled by cartel	Target countries' import demand elasticity	Elasticity of subtitution	Elasticity of noncartel supply	Elasticity of demand for cartel exports
7	.85	2.0	0	0	0
			3	1	2.1
			1,000,000	2	2.7

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SOVIET ECONOMIC ASSISTANCE TO POLAND, 1980-81

By Elizabeth Ann Goldstein[*]

SUMMARY

This paper examines the various types of foreign assistance currently available to Poland from the East and West and analyzes who is providing this assistance. It discusses these issues with the final objective of determining what share of Poland's external assistance was supplied by the Soviet Union and what share by the West during 1980-81.

External assistance is defined here to include grants, credits, loans and trade subsidies. Each of these is associated with a different type of repayment obligation. These future obligations can be political, economic or a combination of both and should be recognized as having some bearing on Poland's current financial situation. A fair discussion of this however goes beyond the scope of the present essay. Here the focus remains exclusively on the recent inflow of resources into the Polish economy.

The results of the analysis imply the burden of Poland's 1980-81 foreign assistance is heavily skewed toward the East, shouldered mostly by the Soviet Union. The estimates show that in 1980, the Soviet Union provided approximately three-fourths of Poland's foreign assistance. This share increased to roughly 90% in 1981.

The help provided by the rest of Eastern Europe was quite limited at best. In 1980 they provided between 1-2% of the total assistance, and by 1981, this share had fallen to an estimated .3%. The CMEA banks however increased their 1981 contribution to almost 6% from less than 2% in 1980.

The West also provided a relatively small share of Poland's foreign assistance for this period. In 1980, the West's share was roughly 21%, falling sharply in 1981 to about 4%. Western governments provided about 12% of Poland's assistance in 1980, rising to slightly over 22% in 1981. In addition, the estimates show that 1980 commercial bank loans accounted for approximately 9% of Poland's assistance while in 1981 this share dropped sharply to negative 18%, indicating Poland's payments of approximately $1.1 billion to Western commercial banks.

The main conclusion drawn from these results is that, although the Soviet Union has granted only a relatively small amount of formal loans to Poland (mostly hard-currency and ruble-trade credits), when account is taken of the "hidden" transfer of resources to Poland through implicit trade subsidization, it is apparent that the

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Soviet Union has been the major source of Poland's external economic assistance during 1980–81.

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I. INTRODUCTION

Over the last decade, Polish leaders have tried to modernize their economy using development strategies that stressed the importation of foreign capital to increase domestic investment, consumption and productivity. A major problem arose when this effort did not result in a viable export sector developing rapidly enough to provide the necessary financing for the imports. Although there were major increases in real output, real personal incomes, investment and consumption through the mid 1970's, poor judgment in the selection of investments, systemic problems inherent in Poland's command economy, and weak macroeconomic management left Poland, by the end of 1981, with a hard-currency foreign debt of $22.5 billion. Because of Poland's relationship with the Soviet Union, the Soviets stepped in to help Poland deal with these foreign obligations as well as the resulting domestic problems. Although this assistance has not been enough to say the Soviets opened their proverbial umbrella over Poland, it has been and will continue to be a major drain on the Soviet Union, exacerbating the Soviet's own economic problems.

To help determine how important this drain is to the Soviet Union, it is useful to examine the various types of foreign assistance currently available to Poland from the East and West as well as analyze who is providing this assistance. This paper will discuss these issues with the final objective of determining what share of Poland's external assistance was supplied by the Soviet Union and what share by the West during 1980–81.

External assistance is defined here to include credits, loans and implicit trade subsidies. Implicit trade subsidies are included because they result in a net transfer of real resources to Poland over and above those which would have accrued from normal trade. Each of these types of assistance is associated with a different form of repayment obligation. These future obligations can be political, economic, or a combination of both and should be recognized as having some bearing on Poland's current financial situation. Discussion of this however goes beyond the scope of the present essay. Here the focus is exclusively on the recent inflow of resources into the Polish economy.

The first section of the presentation is a detailed discussion of the foreign assistance presently available to Poland. The section following presents an empirical analysis of Poland's current and projected financial situation. The paper concludes with a discussion of some important implications of this distribution of foreign assistance. The statistics used and their sources are presented in an appendix.

II. ASSISTANCE AVAILABLE TO POLAND

TYPES OF ASSISTANCE

The main types of assistance recently provided to Poland include hard-currency credits from both the East and West, ruble trade credits from the Soviet Union and Eastern Europe and implicit Soviet aid in the form of trade subsidies.

Hard-currency credits from the West consist of loans from commercial banks (including Middle Eastern and LDC banks), and governments. (The categories of credits covered by the data include long, medium and most short term as well as supplier credits.)

Hard-currency credits from the East include dollar loans primarily from the USSR, but also other East European countries and from the CMEA banks (International Bank for Economic Cooperation, International Investment Bank).

Ruble trade credits are "granted" mostly from the USSR and to a lesser extent by other East European countries. They are defined as the value of Polish imports not equaled by deliveries of Polish exports, i.e., the current merchandise trade deficit.

Finally, implicit trade subsidies are available from the Soviet Union. Their definition is best described in the following way: Suppose that Poland, during 1980–1981, could have substituted the import-export transactions it actually engaged in with the Soviet Union for the same import-export transactions with the West. The actual historical trade balance is valued at CMEA foreign trade prices. The hypothetical trade balance is equal to Polish-Soviet trade flows revalued at East-West trade prices. The subsidy is calculated by taking the historical Polish-Soviet trade balance measured in zlotys (and converted to dollars at the official commercial exchange rate to be discussed below), and subtracting it from the hypothetical Polish-Soviet trade balance measured in dollars. The difference is a Soviet subsidy to Poland if it is negative and a tax on Poland if it is positive. This subsidy represents the amount of hard-currency Poland saved by engaging in trade with the Soviet

Union at actual intra-CMEA foreign trade prices rather than with the West at world market prices. It can also be interpreted as the opportunity cost the Soviets incurred by trading with Poland at CMEA foreign trade prices rather than trading the same goods on the Western market at world market prices. This subsidy represents a transfer of real resources to Poland from the Soviet Union which should be accounted for in an analysis of external economic assistance.

It should be noted that these subsidies arise primarily as a result of the way prices are set by the CMEA countries for intra-bloc trade, and at the outset, were not necessarily provided to Poland as the result of a conscious decision to do so by the Soviets. Since 1975, intra-CMEA prices have been set on the basis of a lagged five-year moving average of dollar world market prices converted into rubles at existing official exchange rates. Thus, for example, the Soviet export price for oil in 1980 was based on the average world market prices during 1975–1979. Over the last decade, world market prices of energy and primary goods have been growing much faster than prices of manufactured goods. Since the Soviet Union exports primarily fuels and non-food raw materials to eastern Europe and imports primarily manufactured goods, the intra-CMEA price formation formula has not worked in favor of the Soviets. At the prices derived by the CMEA price formula, the Soviet Union has been selling fuels and non-food raw materials to Poland at prices below prevailing world market prices and purchasing machinery and consumer goods from Poland at prices above world market prices. In other words, the Soviets could have done better if they bought and sold at world market prices rather than at CMEA foreign trade prices.

The fact that the Soviets have allowed these subsidies to continue does not indicate that they have necessarily been irrational by trading with Poland. Rather, the Soviets may have been making this decision based on the outcome of maximizing a utility function that incorporates other economic, military, political, and ideological variables in addition to traditional gains from trade.[1]

From the Polish point-of-view, this relationship allows Poland to buy specific goods (fuels, energy-related products and non-food raw materials) in quantities that they would have had to pay much more for, or possibly not been able to afford, if they had been faced with paying world market prices. It also allows Poland to sell manufactured goods at prices much higher than those that would be obtained on the world market. Thus, the relationship allows the Poles to trade on better terms than would otherwise be available.

Clearly, this does not mean that the Poles are better off as a client state of the Soviet Union. The sacrifice of political, military, and ideological autonomy must be weighed against the economic benefits that accrued. Also, by allowing the subsidies to be concentrated in exports of relatively cheap energy, Poland has been encouraged to become an excessive energy consumer. For example, in 1980 the Soviet price for oil was 52% below the comparable world market price at official exchange rates and 70% below at commercial exchange rates. By distorting the relative price of energy, the Soviet subsidy has temporarily shielded Poland from the higher world energy prices. But because the Polish leadership, for various reasons, was not able to adjust their industrial structure during the past decade, this has left Poland in a less competitive position in the world market of the 1980's.

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[1] See Marrese and Vaňous, 1981, Implicit Subsidies in Soviet Trade with Eastern Europe, forthcoming as a monograph published by the Institute of International Studies, University of California, Berkeley, summer 1982, for further development of this idea.

These subsidies represent an important source of resources for Poland. The results presented in table 1 emphasize this point by showing that, in 1980, the subsidies accounted for more than two-thirds of total Soviet assistance and continued at well over one-half of total Soviet assistance in 1981. Because these subsidies represent such a large share of Poland's assistance from the Soviet Union, it is important to clearly understand how they were derived. The rest of this section is devoted to explaining the methodology used in the calculations as well as discussing several problems with various aspects of the methodology.

TABLE 1.—COMPOSITION OF SOVIET ASSISTANCE TO POLAND

[In percent]

	1980	1981
"Implicit" subsidies [1]	83.7	69.0
Ruble trade credits [2]	16.3	7.1
Hard currency credits [3]	0.0	24.0

[1] Calculated by author.
[2] Wharton Econometric Forecasting, Associates, data bank.
[3] Wharton estimate.

METHODOLOGY USED IN SUBSIDY CALCULATIONS

Two important assumptions that underly the calculations of Soviet "implicit" trade subsidies must be kept in mind. First, it is assumed that the unit values (total value divided by quantity) of Polish imports from and exports to the developed West are appropriate proxies for prices which would be in effect if Poland redirected all of its trade to the developed West. Second, it is assumed that the same quantities would be traded with the West as were traded with the Soviet Union implying Poland has no hard currency constraint. Discussion of these assumptions, and the controversies surrounding them, are presented later in the paper.

The subsidy calculations were done according to the Marrese-Vanous methodology using the following four steps (see footnote 1.) First, because CMEA foreign trade prices are usually quoted in rubles, the value of 1980 Polish-Soviet imports and exports were converted to rubles at the official 1980 ruble/zloty exchange rate of .225 rubles per zloty. The total ruble values were then divided by the actual quantities traded to obtain unit ruble values, referred to here as intra-CMEA foreign trade prices.

To obtain unit dollar values the same procedure was followed. The value of 1980 Polish trade with the West was converted into dollars using the official 1980 dollar/zloty exchange rate of .327

dollars per zloty.[2] Dividing the total dollar values of these imports and exports by their respective quantities traded results in unit dollar values for imports and exports with the West. Since the West includes many countries, the values and quantities for each commodity were summed across all the developed Western and Middle Eastern countries.

Second, these unit values were used to calculate 1980 dollar/ruble derived exchange rates to translate the ruble trade flows valued at intra-CMEA foreign trade prices into dollar trade flows valued at world market prices. This was done on the basis of a sample of commodities with less than 100% coverage. The percentage covered is reported in the statistical appendix. The exchange rates were derived for each commodity category of Polish exports and imports and thus are a weighted average for the category. The weights are actual quantities of those commodities retained in the sample.[3] These exchange rates indicate which categories the Soviets underprice to the Poles and which they overprice relative to the official commercial exchange rate the Poles use (this commercial rate is also referred to as the settlement rate and is discussed below). When the derived dollar/ruble exchange rate for Polish imports is greater than this commercial exchange rate, the Soviets are underpricing their exports to Poland relative to what the price could be on the Western market. When the derived dollar/ruble exchange rate for Polish exports is less than the commercial rate, the Soviets are paying more for imports from the Poles than they would on the Western market. From the data it is clear that, relative to the official 1980 commercial exchange rate, the Soviet Union is underpricing its exports to Poland and "overpricing" its imports from Poland. The 1981 derived exchange rates were obtained by using the 1980 derived exchange rates as a benchmark and dividing by the ratio of 1981 ruble price changes to 1981 dollar price changes for each commodity category.[4]

Third, using the derived exchange rates, Polish ruble trade flows are converted into dollars. This is done with the assumption that

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[2] The official 1980 dollar/zloty exchange rate is used because this is how the zloty data were originally derived.

[3] The value of Polish imports and exports are denoted by VMR_{ijt}, VXR_{ijt} for each commodity i, in category j, for year t. The actual quantities traded are denoted by QM_{ijt}, QX_{ijt} and unit values for imports and exports are PMR_{ijt}, and PXR_{ijt} for commodity i, in category j, for year t. 1980 Polish imports and exports with the West converted into dollars using the official 1980 dollar/zloty exchange rate are denoted VMD_{ijt}, VXD_{ijt} and unit values for imports and exports with the West are PMD_{ijt}, PXD_{ijt}. Specifically, for category j, the derived exchange rates are:

$$EDRX_j = \sum_{i=1}^{X_j} (QM_{ijt} \cdot PMD_{ijt}) / \sum_{i=1}^{X_j} (QM_{ijt} \cdot PM_{ijt})$$

$$EDRM_j = \sum_{i=1}^{X_j} (QX_{ijt} \cdot PXD_{ijt}) / \sum_{i=1}^{X_j} (QX_{ijt} \cdot PXR_{ijt})$$

where $i = 1, \ldots, x_j, n_j$, $j = 1, \ldots, 13$
and $(1, \ldots, x_j)$ indexes all commodities i in category j for which unit values are acceptable proxies.

[4] The formula used is the following:
$EDRM_{jt+1} = EDRM_{jt} / (P^{R}_{jt+1} / P^{\$}_{jt+1})$
$EDRX_{jt+1} = EDRX_{jt} / (P^{R}_{jt+1} / P^{\$}_{jt+1})$
where P^{R}_{jt+1} and $P^{\$}_{jt+1}$ are ruble and dollar price indices by commodity categories for the appropriate year.

the derived exchange rate for each commodity is valid for the entire trade in a given commodity category.[5]

Finally, step four, the trade subsidy received by Poland is calculated. For each year and each commodity category, the ruble value of Polish trade, converted to a dollar value at the settlement exchange rate, F_t, is subtracted from the dollar trade balance. The total annual subsidy is obtained by summing over the commodity categories in that year.[6]

$$MTR_{jt} = \sum_{i=1}^{n_j} VMR_{ijt} \text{ and } XTR_{jt} = \sum_{i=1}^{n_j} VMR_{ijt}.$$

In practice, not all commodities are reported individually so the reported category totals (MTR_{tj}, XTR_{jt}) are sometimes greater than the simple sums

$$\left(\sum_{i=1}^{n_j} VMR_{ijt}, \sum_{i=1}^{n_j} VXR_{ijt}\right)$$

The settlement exchange rate referred to above, is the internal official commercial exchange rate obtained from Polish sources. This rate can be thought of as the realistic rate at which trade surpluses or deficits with the Soviet Union, denominated in rubles, can be eliminated by dollar payments to or from the Soviet Union. The settlement rate is needed for the calculation of subsidies whenever the Polish-Soviet ruble trade balance is different from zero. If Poland has a ruble trade deficit with the Soviet Union, the Soviets have a claim on future deliveries of imported commodities. If it is assumed that the surplus will be liquidated by future deliveries of the typical average import bundle of commodities, then the settlement rate will make both parties just indifferent between liquidating the surplus by dollar payments or by physical delivery of the typical Polish export bundle.[7]

The subsidy values for 1980 and 1981 are presented in table 2. The derived exchange rates and values of Polish-Soviet trade by commodity category are presented in the appendix.

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[5] Thus for commodity category j, the value of exports and value of imports measured at world market prices and in dollars is:

$VMW_{jt} = MTR_{jt}{}'EDRM_{jt}$

$VXW_{jt} = XTR_{jt}{}'EDRX_{jt}$

where MTR_{jt}, XTR_{jt} are the ruble values of the entire commodity category j for imports and exports. In theory,

In practice, not all commodities are reported individually so the reported category totals (MTR_{tj}, XTR_{tj}) are sometimes greater than the simple sums

[6] The subsidy for category j in year t is:

$S_{jt} = (VXW_{jt} - VMW_{jt}) - (XTR_{jt} - MTR_{jt})F_t$

The total subsidy received over all categories is:

$S_t = (VXW_t - VMW_t) - (XTR_t - MTR_t)F_t$

The first term on the right-hand-side represents the value of the dollar trade balance for category j in S_{jt} and for total trade in S_t. The second term on the right-hand-side represents the netting out of the overall Polish trade balance, measured in rubles, once it has been converted to a dollar value at the settlement exchange rate, F_t.

[7] It is possible to decompose the subsidy into export and import components and then further into export and import components which consider the difference between the official exchange rate and settlement rate. The decomposition equations may be written:

$S_{jt} = (VXW_{jt} - (XTR_{jt}.F_t)) + (-VMW_{jt} + (MTR_{jt}.F_t))(a)$

$S_{jt} = (VXW_{jt} - (XTR_{jt}.E/_{R})) + (-VMW_{jt} + (MTR_{jt}.E/_{R})) + (-XTR_{jt}(F_t - E/_{R})) + (MTR_{jt}(F_t - E/_{R}))(b)$

In equation (a), the right-hand-side divides the subsidy into total export and total import components. In equation (b), the first term on the right-hand-side represents the export component if the subsidy is calculated according to the official 1980 exchange rate of 1.54 dollars per one ruble. The second term represents the import component if the subsidy is calculated according to the official 1980 exchange rate. The third term is the export component due to the difference between the settlement exchange rate and the official exchange rate. The fourth term is the import component due to the difference between the settlement exchange rate and the official exchange rate. The calculations are presented in the appendix. The decomposition shows that although the overall subsidy is only marginally affected when trade between Polant and the Soviet Union is valued at the official exchange rate, the composition of the overall subsidy will be affected when using different estimates of the settlement exchange rate.

TABLE 2.—"IMPLICIT" SOVIET TRADE SUBSIDIES TO POLAND BY COMMODITY CATEGORY [1]

[Millions of current dollars]

Category	1980	1981
Total [2]	3,630	3,851
Fuels and Energy	2,746	2,945
Metallurgy	267	223
Machinery	105	109
Chemicals	326	339
Minerals	52	6
Wood/paper	81	138
Light industry	11	16
Food	8	46
Other branches	0	1
Construction	20	9
Agriculture	18	22
Forestry	2	1
Unclassified	−1	−5

[1] See the appendix for a detailed decomposition of the subsidy calculation for 1980.

[2] Negative signs on the subsidies were not included because from the Soviet point-of-view these values represent an outflow from the Soviet Union to Poland.

SOME METHODOLOGICAL PROBLEMS

In the course of doing the sudsidy calculations several problems arose that had to be resolved. First, it was necessary to insure a suffcient level of homogeneity within commodity categories for which intra-CMEA and East-West trade prices were being compared. Because the degree of homogeneity declines as the level of processing increases, comparison unit values for primary commodities is more appropriate than for manufacturers. In the cases where the commodities were not thought to be sufficiently homogeneous they were excluded from the sample.[8]

Second, within some commodity categories there was very poor sample converage. When a category had zero coverage it was excluded from the analysis. Fortunately, the least important categories were the ones that had to be excluded. In the case of a commodity category having poor sample coverage, the unit values were assumed to be related to world market prices as the corresponding import or export of another very similar commodity.[9]

The third problem and one that could not be resolved satisfactorily was consideration of the presence of trade in dollars between Poland and the Soviet Union. No direct information on the proportion of Polish exports to and imports from the Soviet Union which are bought or sold for dollars is available and therefore it was not possible to adjust the calculations for the bias due to this omission.[10]

The last and most discussed problem was that of choosing the correct opportunity cost measure for Polish-Soviet trade. East-West trade prices by categories of commodities are viewed as the correct measure on theoretical grounds, but these are not available. Instead, observed unit values of Polish exports and imports with the developed West are used as proxies for prices that would be in effect if Poland redirected all of its trade to the developed West. Unit values were chosen over other suggested measures such as "use" value and "fair" prices because these notions present problems of their own. "Use" values are unobservable, neglect gains from trade, and are based on quality differences. "Fair" prices include considerations that are not just economic but are also of an ethical nature and the purpose of this calculation is to analyze actual opportunity cost based only on economic considerations.[11]

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[8] See Marrese and Vanous, chapter IX.

[9] See Marrese and Vanous, chapter IX.

[10] See Marrese and Vanous, chapter IX for a method to determine the bias for a given set of parameters.

The choice of East-West trade prices does however introduce two problems. First, some commodities imported by Poland from the Soviet Union are not also imported from the West, leading to missing observations of East-West trade prices. Missing observations were filled in from other sources or not counted in the sample when sufficient information on other commodities in that category was available. Second, in some cases, the observed quantities of Polish exports to and imports from the West were very small, implying that the observed dollar unit values might not prevail if trade increased by more than marginal amounts. However, since Polish trade represents such a small share of world trade, it was assumed that a perfectly elastic supply of Western goods and demand for Polish goods exists on the world market.

It is important to point out that the derived exchange rates for manufactures and machinery and equipment may exhibit an upward bias as a result of the differing commodity composition of these categories within the CMEA relative to the developed West. There is a general tendency for East European manufactures and machines traded within the CMEA to be heavier than those exported to the West. This can lead to unit values for these commodities traded within CMEA to be low relative to those traded with the West and thus bias the derived exchange rates upward because the unit value calculation takes total value and divides by weight. This would imply that the final subsidy calculation is too low.

On the other hand, some critics have argued that the derived exchange rates in these categories are instead biased downward leading to a final subsidy value that is too high.[12] In light of these potential downward biases (see footnote 12), a sensitivity analysis was performed to determine by how much the final subsidy calculations would change when using a range of values for the exchange rates in these categories. The derived exchange rates for machinery and light industry were increased first by 25 percent, then 50 percent and finally, the official dollar/ruble exchange rate was used. The official dollar/ruble exchange rate represents a 90 percent increase for machinery and a 59 percent increase for light industry in 1980. The subsidies were recalculated three times, one for each increase of the derived exhange rates for machinery and light industry, always leaving the exchange rates in all other categories at their originally determined levels. The results are presented in table 3 (more detailed results are presented in the appendix):

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[11] See Marrese and Vanous, chapters II, IX, XIII and appendices II, VII for a detailed discussion and see Marer, Paul, 1982, The Council for Mutual Economic Assistance, Integration or Domination? or the Soviet Union's Political-Economy Relations with Eastern Europe, forthcoming.

[12] It is argued that to sell large quantities of these goods in the West the Polish export price would have to be substantially discounted. In previous studies educated guesses were made regarding the magnitude of the discount and the unit value was adjusted accordingly. Critics have contended that these guesses were too large and the resulting derived exchange rates were biased downward leading to overestimation of the subsidies (see footnote 11). Because this issue has not been satisfactorily resolved, no discount is explicitly assumed in the subsidy calculations in this paper.

In addition, it is argued that the subsidies are not necessarily being given just because the Soviet Union imports machines at high prices that may seem inferior to those in the West. These machines may in fact be better suited for the Soviet Union than the higher technology Western models. Thus including these transactions in the subsidy calculations also leads to a downward bias in the derived exchange rate and an upward bias in the subsidy calculation.

The possibility of a downward bias in the derived exchange rate for these reasons is addressed in the sensitivity analysis by assuming the actual exchange rate calculations, which implicitly include quality differences, are too low for machinery and light industry.

TABLE 3.—SENSITIVITY RESULTS: SOVIET SUBSIDIES UNDER VARYING ASSUMPTIONS OF EXCHANGE RATES [1]

[Millions of current dollars]

Assumption	1980	1981
Derived	3,630	3,851
125 percent of derived	3,426	3,735
150 percent of derived	3,212	3,575
Official $/R	3,002	3,418
Percentage decrease from derived:		
125 percent of derived	5.6	3.8
150 percent of derived	11.5	7.2
Official $/R	17.3	11.2

[1] Note.—The negative signs are not included here because from the Soviet point of view these values represent an outflow from the Soviet Union to Poland.

It is apparent from these tables that the drop in total subsidies was not very large when the derived exchange rates for machinery and light industry were increased by successive amounts. The results show that the upward bias discussed by the critics is not significant enough to change the overall subsidies by more than approximately 17 percent at most. It is therefore possible to make the general statement that Poland is receiving substantial subsidies from the Soviet Union in spite of the possibility of a downward bias in the calculations of the derived exchange rates. Furthermore, these results imply, that the subsidy values calculated in this paper can legitimately be used as general estimates for the purpose of assessing the distribution of Poland's foreign economic assistance. The next section discusses in more detail the empirical results of the subsidy calculations as well as other forms of assistance mentioned earlier.

III. FOREIGN ECONOMIC ASSISTANCE TO POLAND 1980–81

In 1980, total foreign assistance to Poland was roughly $5.8 billion (see table four). It is estimated that this was provided from the East and West in the following way: total Eastern assistance amounted to approximately $4.5 billion. Of this, about $4.3 billion (95 percent) came from the Soviet Union, $105 million (2 percent) came from the CMEA bloc and $100 million or (2 percent) from CMEA banks. Aid from the CMEA bloc was in the form of ruble trade credits that were approximately equal to 105 million rubles (see table five).

Soviet assistance was provided in three forms: direct hard-currency loans, ruble trade credits (converted at the commercial exchange rate) and implicit dollar subsidies described earlier. It is believed that the Soviets did not give a substantial amount of direct dollar loans in 1980, but did give 707 million rubles in the form of ruble trade credits to cover the Polish 1980 dificit with the Soviet Union. Implicit trade subsidies were estimated to be $3,630 million and represented almost 80 percent of total Eastern assistance. A rough estimate shows that subsidies implicit in fuels and energy trade accounted for 75 percent of the total subsidy, with trade in chemicals running second at about 9 percent and metallurgy trade third, accounting for 7 percent of the 1980 level. Machinery trade carried only about 3 percent of the total subsidy and light industry slightly less than .3 percent.

Total Western assistance in 1980 amounted to about $1.3 billion. This was divided between commercial bank credit of an estimated $553 million (44 percent) and government credit of about $700 million (56 percent).

In 1981, total foreign assistance to Poland increased almost 7 percent to just over $6 billion. Of this, total Eastern assistance is estimated at $6 billion with the Soviet portion accounting for approximately 93 percent or $5.6 billion. The assistance by the rest of the CMEA countries is believed to have fallen by a dramatic 80 percent to $21 million from $105 million in 1980. Of the total CMEA aid, an estimated $50 million was in direct hard-currency loans while Poland actually paid out approximately 34 million rubles ($29 million) in ruble trade credits to the CMEA (this accounts for the negative sign in the table below). Assistance by CMEA banks rose to about $370 million (6 percent) from a very limited amount in the previous year.

The breakdown of Soviet aid to Poland reveals substantial increases in hard-currency loans as well as sharp increases in ruble trade credits. Direct hard-currency loans are believed to be $400 million while ruble trade credits amounted to about 1.6 billion rubles ($1.3 billion)—almost a 120 percent increase over the ruble amount given in 1980. The increase in ruble trade credits was primarily due to an 11 percent drop in Polish exports to the USSR at the same time as Polish imports from the Soviets rose by almost the same percentage.

Implicit trade subsidies to Poland in 1981 amounted to approximately $3.8 billion—a 6 percent increase over the 1980 amount. This also represented about 68 percent of the total Eastern assistance in 1981—down from 80 percent in 1980. The fall in the relative share of these subsidies out of total Eastern assistance is attributed to adjustments in relative foreign trade prices within the CMEA. The Soviets seem to have compensated by providing increased amounts of different forms of assistance. Direct hard-currency loans were increased from a negligible amount in 1980 to $400 million in 1981, and ruble trade credits were increased by approximately 120 percent from 1980. A rough estimation of the relative composition of the subsidies shows that it did not change from 1980. Fuels and energy still represent the largest share, about 76 percent, chemicals following second at about 9 percent and metallurgy third at about 6 percent. Machinery still trails at approximately 3 percent, and light industry at .4 percent.

Total Western assistance in 1981 is estimated at $252 million—a sharp 80 percent decrease from the 1980 estimate. Official loans accounted for approximately $1.4 billion while commercial bank exposure fell dramatically from an inflow of $553 million in 1980 to an estimated outflow of $1.1 billion.

From this discussion it is clear that Poland received a substantial amount of foreign assistance during 1980–1981. In 1980, this assistance was equal to approximately 6.8 percent of Poland's GDP and in 1981 the percentage rose to almost 8 percent.[13] Because a portion of this assistance had to be repaid, it contributed to increasing the already existing debt and debt-servicing problems faced by Poland. By 1981, these problems were so severe that Poland was forced to negotiate with its 15 major Western creditors on debt relief. On April 27, 1981 Poland rescheduled and refinanced 90 percent of its Western guaranteed credits. These were credits that were unpaid during January through April 1981, and due to mature in May through December. The sum totaled $2.6 billion. Poland also reached an agreement with Western commercial banks in September 1981 on financial terms for rescheduling $2.4 billion in principal payments on unguaranteed debt due from April 1981.[14]

TABLE 4.—FOREIGN ASSISTANCE TO POLAND 1980–81 [1]

[Dollar amounts in millions of current dollars-percent of total]

	1980		1981	
	Amount	Percent	Amounts	Percent
Total	$5,793.1	100	$6,232.8	100
Eastern assistance	4,540.1	78.3	5,980.8	95.9
Soviet Union	4,335.4	74.8	5,589.7	89.7
Eastern Europe	104.8	1.8	21.1	.3
CMEA banks	100.0	1.7	370.0	5.9
Western assistance	1,253.0	21.7	252.0	4.0
Government	700.0	12.0	1,400.0	22.0
Commercial banks	553.0	9.5	−1,148.0	−18.4

[1] Estimates made by the author on the basis of information provided by official Polish economic memorandum supplied to Western banks.

TABLE 5.—COMPOSITION OF EASTERN ASSISTANCE TO POLAND 1980–81 [1]

[Millions of current dollars or rubles]

	1980	1981
Eastern dollar credits ($)	100.0	820.0
Soviet Union	0	400.0
Eastern Europe	0	50.0
CMEA banks	100.0	370.0
Eastern ruble credits ($)*	810.1	1,309.8
Soviet Union	705.4	1,338.7
Eastern Europe	104.8	−28.9
Soviet trade subsidies ($)	3,630.5	3,851.0

*Note: The original ruble values of these credits are:

[1] For source see note to table 4.

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[13] Wharton Centrally Planned Economies Outlook, April 1982, p. 57.

[14] Wharton Centrally Planned Economies Outlook, April 1982, pp. 50, 53.

	1980	1981
Eastern ruble credits (R) [1]	812.0	1,541.0
Soviet Union	707.0	1,575.0
Eastern Europe	105.0	* – 34.0

[1] Calculated by author.

TABLE 6.—SHARES OUT OF TOTAL EASTERN ASSISTANCE [1]

[In percent]

	1980	1981
Soviet Union	95.5	93.5
Eastern Europe	2.3	.3
CMEA Banks	2.2	6.2

[1] Calculated by author.

IV. SUMMARY AND CONCLUSION

The statistics just discussed and summarized in the table below, imply the burden of Poland's 1980–1981 foreign assistance is heavily skewed toward the East, shouldered mostly by the Soviet Union. The estimates show that in 1980, the Soviet Union provided approximately three-fourths of Poland's foreign assistance. This share increased to roughly 90 percent in 1981.

The help provided by the rest of Eastern Europe was quite limited at best. In 1980 they provided between 1–2 percent of the total assistance, and by 1981, this share had fallen to an estimated .3 percent.[15] The CMEA banks however increased their 1981 contribution to almost 6 percent from less than 2 percent in 1980.

The West also provided a relatively small share of Poland's foreign assistance for this period. In 1980, the West's share was roughly 21 percent, falling sharply in 1981 to about 4 percent. Western governments provided about 12 percent of Western assistance to Poland in 1980, rising to slightly over 22 percent in 1981 (when total Western assistance was at its low). In addition, the estimates show that 1980 commercial bank loans accounted for approximately 9 percent of Poland's assistance while in 1981 this exposure was sharply curtailed.

An important conclusion may be drawn from these results. Although the Soviet Union has granted only a relatively small amount of formal loans to Poland (mostly hard-currency and ruble-trade credits), when account is taken of the transfer of resources to Poland through implicit trade subsidization, it is apparent that the Soviet Union has been the major source of Poland's external economic assistance during 1980–1981.

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[15] It is possible that this share is greater than .3 percent, however the reports indicating this cannot be confirmed because none of the East European countries—in particular Hungary and East Germany—will admit to borrowing on behalf of Poland.

TABLE 7.—SHARES OF ASSISTANCE TO POLAND OUT OF TOTAL EXTERNAL ASSISTANCE BY THE EAST AND WEST [1]

[In percent]

Country	1980	1981
Eastern assistance	78.3	95.9
Soviet Union	74.8	89.7
Eastern Europe	1.8	.3
CMEA banks	1.7	5.9
Western assistance	21.7	4.1
Government	12.1	22.6
Commercial banks	9.6	−18.5

[1] For source see table 4.

Since the Soviet Union itself has been and will continue in the near future to experience hard currency constraints and domestic economic problems, this implies that their financial relationship with Poland is an important economic problem that will persist well into the 1980's. While discussion of precisely how the Soviets might remedy this situation goes beyond the scope of this essay, a few words about the possibilities that might be plausible are in order.

For the Soviets to consider providing less assistance, they must deal with the tradeoff between economic assistance and political control—less assistance implies less political control. If the Soviets believe the importance of their domestic economic problems outweighs their desire to maintain the current level of political control in Poland their decision might be to lessen their financial burden by becoming more lenient toward the reforms required as preconditions for financial assistance from the West. The implications of this being increased trade and credits from the West with a larger share of Poland's assistance coming from the West.

On the other hand, the Soviets may decide that the negative consequences of their giving up some political control in Poland outweighs the importance of their domestic economic problems. If so, they might continue to provide the greater share of Poland's assistance as best they can with the "freedom" of not having to agree to reforms required by the West. The implications of this decision would be limited access to Western trade and credits and low levels as well as growth rates of national income etc. in Poland. In this scenario it would be necessary to carefully monitor the economic conditions in Poland so they do not become so bad that they themselves lead to instability, the very situation that they are trying to avoid.

V. STATISTICAL APPENDIX

The calculation of implicit subsidies in Polish trade with the Soviet Union required the following data for the 1980–81 period: (1) value of exports and imports between Poland and the Soviet Union by individual commodities and overall commodity categories in zlotys (2) physical quantities of Polish exports and imports of individual commodities by country recorded in metric tons, square cubic meters, hectoliters, pieces, etc. (3) unit values (price per ton) of Polish exports to and imports from the developed West of individual countries measured in U.S. dollars.

The choice of aggregation of trade flows into 13 major commodity categories was based on the Polish aggragation scheme used in the official statistical handbook for 1981, Rocznik Statystyczny Handlu Zagranicznego 1981. Although it is also possible to look at Polish-Soviet trade using official Soviet statistics, as Marrese and Vanous have done, Polish statistics were chosen here for several reasons. The Polish yearbook has more information than the Soviet yearbook. It provides physical volume as well as value of commodities traded allowing zlotys per unit, or with use of an appropriate exchange rate, rubles or dollars per unit to be calculated. The Soviet yearbooks since 1976 typically give just values. It is the odd occasion that quantity is listed as well. The Polish yearbook has fewer unspecified commodities than the Soviet yearbook. Since 1976 the Soviets have very noticeably increased the proportion of commodity trade flows for which neither the value nor the quantity of trade is reported. This is also reflected in rising residuals of unspecified overall trade. The Polish yearbook also gives more disaggregated information than the Soviet yearbook. By comparing various years of the Soviet yearbooks, it can be shown that as far back as 1968 they started increasing the level of aggregation of commodity flows. The assumption that allows substitution of Polish statistics for Soviet statistics and vice-versa is that the reporting by the Soviets and the Poles of identical items is the same.

TABLE 8.—DERIVED DOLLAR/RUBLE EXCHANGE RATES BY COMMODITY CATEGORY WITH PERCENT OF SAMPLE COVERAGE FOR 1980

Category	EDRM$_j$ [1]			EDRX$_j$		
	1980	1981	Percent	1980	1981	Percent
Total	1.78	1.62	56	0.93	0.81	50
Fuels and energy	2.75	2.35	91	1.27	1.40	94
Metallurgy	1.56	1.28	67	1.49	.98	93
Machinery	.81	.72	13	.81	.70	43
25 percent	1.01	.90		1.01	.87	
50 percent	1.22	1.09		1.22	1.06	
Official	1.54	1.37		1.54	1.34	
Chemicals	2.76	2.33	73	1.18	1.10	51
Minerals	2.71	2.33	58	1.15	1.07	90
Wood/Paper	1.98	1.78	57	1.43	1.03	95
Light Industry	.97	.87	98	.97	.82	51
25 percent	1.21	1.09		1.21	1.03	
50 percent	1.46	1.31		1.46	1.24	
Official	1.54	1.38		1.54	1.30	
Food	1.50	1.44	85	1.11	.95	78
Other branches	1.78	.82	0	.94	.80	17
Construction	81	.72	0	.81	.70	0
Agriculture	1.55	1.45	89	1.21	.99	86
Forestry	1.55	1.17	0	1.21	0	0
Unclassified	1.78	1.54	0	.93	1.31	0

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[1] EDRM$_j$ equals derived dollar ruble exchange rate for import commodity j. EDRX$_j$ equals derived dollar ruble exchange rate for export commodity j.

TABLE 9.—*Settlement dollar/ruble exchange rate*

	F_t
1980	0.9977
1981	.85

TABLE 10.—RUBLE VALUE OF POLISH-SOVIET TRADE BY COMMODITY CATEGORIES[1]

[In million current rubles]

Category	Imports		Exports	
	1980	1981	1980	1981
Total	4,348	4,811	3,641	3,236
Fuels and energy	1,610	2,036	277	199
Metallurgy	538	539	71	67
Machinery	1,609	1,526	2,169	2,050
Chemicals	219	279	331	295
Minerals	31	5	3	4
Wood/paper	104	157	48	42
Light industry	136	140	520	453
Food	29	82	58	26
Other branches	19	3	16	14
Construction	1	0	106	62
Agriculture	44	40	29	13
Forestry	6	2	0	0
Unclassified	3	1	11	10

[1] The exchange rate used to convert the zloty value of trade reported in the Polish statistical handbook to rubles was .225 rubles per zloty.

TABLE 11.—BREAKDOWN OF 1980 TRADE SUBSIDY CALCULATION [1]

[In millions of dollars or rubles]

Category	XTR_i	$EDRX_i$	VXW_i	MTR_i	$EDRM_i$	VMW_i	(VXW_i-VMW_i)	$(XTR_i-MTR_i)F_i$	Subsidy [2]
Fuels and energy	277.4	1.27	352.3	1,610.0	2.75	4,427.6	−4,075.3	−1,329.6	−2,745.7
Metallurgy	71.4	1.49	106.4	538.1	1.56	839.4	−733.0	−465.6	−267.4
Machinery: [1]									
(a)	2,169.0	.81	1,757.2	1,609.6	.81	1,303.8	453.5	558.6	−105.1
(b)		1.01	2,191.1		1.01	1,625.7	565.4		6.8
(c)		1.22	2,646.7		1.22	1,963.7	683.0		124.4
(d)		1.54	3,340.9		1.54	2,478.8	862.1		303.5
Chemicals	330.7	1.18	390.2	219.2	2.76	605.1	−214.9	111.2	−326.1
Minerals	2.6	1.15	3.0	30.9	2.71	83.8	−80.8	−28.2	−52.5
Wood/paper	48.4	1.43	69.2	104.3	1.98	206.5	−137.3	−55.8	−81.5
Light industry:									
(a)	520.5	.97	504.9	135.8	.97	131.7	373.1	383.8	−10.7
(b)		1.21	629.8		1.21	164.3	465.5		81.7
(c)		1.46	759.9		1.46	198.3	561.6		177.8
(d)		1.54	801.6		1.54	209.1	592.5		208.7
Food	58.5	1.11	64.9	28.9	1.50	43.3	21.6	29.5	−7.9
Other branches	15.6	.94	14.7	19.2	.94	18.0	−3.4	−3.6	.21
Construction	106.6	.81	86.3	1.3	.81	1.0	85.3	105.1	−19.8
Agriculture	28.8	1.21	34.8	43.7	1.55	67.7	−32.9	−14.9	−18.0
Forestry	0	0	0	6.5	1.25	8.2	−8.2	−6.5	−1.7
Unclassified	11.0	1.54	16.9	.3	1.54	.4	16.5	10.7	5.8

m:									
(a)	3,640.9	.93	3,400.8	4,347.8	1.78	7,736.5	−4,335.8	−705.3	−3,630.5
(b)		1.09	3,959.6		1.86	8,091.0	−4,131.5		−3,426.1
(c)		1.25	4,545.3		1.95	8,463.0	−3,544.7		−3,212.4
(d)		1.45	5,281.2		2.07	8,988.9	−3,707.8		−3,002.4

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[1] XTR_j equals ruble value of total exports in category j.
$EDRX_j$ equals derived exchange rate for exports in category j.
VXW_j–equals dollar value of total exports in category j.
MTR_j–equals ruble value of total imports in category j.
$EDRM_j$ equals derived exchange rate for imports in category j.
VMW_j equals dollar value of total imports in category j.
$(VXW_j\text{-}VMW_j)$ equals total dollar trade balance.
$(XTR_j\text{-}MTR_j)F_t$ equals total ruble trade balance converted to dollars at the settlement exchange rate (ie, this is the amount necessary for settlement).
F_{1980} equals .9977:
(a) equals estimates using original derived dollar/ruble exchange rate for all j.
(b) equals estimates using 125% of the original derived exchange rate for machinery and light industry.
(c) equals estimates using 150% of the original derived exchange rate for machinery and light industry.
(d) equals estimates using the official exchange rate for machinery and light industry.

[2] The negative sign on the subsidy indicates a tax on the Soviet Union from the Polish point-of-view and a subsidy to Poland from the Soviet point of view.

TABLE 12.—DECOMPOSITION OF THE 1980 TRADE SUBSIDIES

[Millions of current dollars]

Category	Subsidy [1]	Total export component	Official export component	Settlement export component
Fuels and energy	−2,745.8	75.5	−75.1	150.6
Metallurgy	−267.4	35.2	−3.6	38.8
Machinery	−105.1	−407.2	−1,585.0	1,177.8
Chemicals	−326.1	60.2	−119.3	179.5
Minerals	−52.5	.4	−1.0	1.4
Wood/paper	−81.5	20.9	−5.4	26.3
Light industry	−10.7	−14.4	−297.0	282.6
Food	−7.9	6.6	−25.2	31.8
Other branches	.2	−.9	−9.3	8.4
Construction	−19.8	−20.0	−77.9	57.9
Agriculture	−18.0	6.0	−9.6	15.6
Forestry	−1.7	0	0	0
Unclassified	5.8	6.0	0	6.0
Sum	−3,630.5	−231.7	−2,208.4	1,976.7

Category	Total import component	Official import component	Settlement import component
Fuels and energy	−2,821.3	−1,947.2	−874.1
Metallurgy	−302.5	−10.4	−292.1
Machinery	302.0	1,175.9	−873.9
Chemicals	−386.4	−267.4	−119.0
Minerals	−53.0	−36.2	−16.8
Wood/paper	−102.4	−45.8	−56.6
Light industry	3.8	77.5	−73.7
Food	−14.5	1.2	−15.7
Other branches	1.1	11.6	−10.5
Construction	.3	1.0	−.7
Agriculture	−24.1	−.4	−23.7
Forestry	−1.7	1.8	−3.5
Unclassified	−.1	0	−.2
Sum	−3,398.8	−1,,038.4	−2,360.4

[1] See note on table 11 pertaining to the subsidy.

A PUZZLE IN SOVIET FOREIGN TRADE STATISTICS AND POSSIBLE IMPLICATIONS FOR ESTIMATES OF SOVIET ARMS EXPORTS TO DEVELOPING COUNTRIES

By Thomas A. Wolf* and Ed. A. Hewett †

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I. INTRODUCTION

Of all the gaps in official Soviet foreign trade statistics, perhaps none has been more tantalizing than that relating to Soviet trade with the "developing countries" (LDCs). In particular, the USSR does not report arms deliveries to these countries, and therefore Western analysts have proceeded to develop several alternative methodologies for their estimation.[1] Our detailed analysis of Soviet foreign trade statistics for 1973–74 has uncovered a possibly significant puzzle in the reported figures for foreign trade with *all* capitalist countries (i.e., trade with the LDCs and the "industrially developed capitalist countries" (DCCs)). This suggests in general that either (1) published Soviet trade data are not as internally consistent and reliable as Western analysts typically presume, or (2) if reliable, they must be interpreted with greater care than previously. Either way, our analysis suggests that Western analysts may have significantly understated Soviet arms shipments in real terms, in 1974.

We have focused on 1973–74 because official statistics on the development of trade with the capitalist countries in that period are particularly perplexing. Columns (2) and (4) of Table 1 record the

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[1] For a discussion of three alternative methodologies, see Vanous (1981). Also see CIA (November 1978), Montias (1974) and Ofer (1976).

percentage changes, for 1973 and 1974, of Soviet real exports and export unit values (hereafter referred to as export "prices," for simplicity) for aggregate Soviet exports to the capitalist countries. These figures are calculated directly from data provided in *Vneshniaia Torgovlia SSSR: statisticheskii sbornik.* Columns (1) and (3) report analogous figures for a group of eight major primary product exports to DCCs. These eight product groups (petroleum and petroleum products, coal, sawlogs, lumber, cotton, iron ore, rolled ferrous metals, and non-ferrous metals) accounted for roughly 60 percent of Soviet exports to DCCs and amounted to over one-third of total Soviet exports to the capitalist world in 1973–74.[2]

TABLE 1.—GROWTH RATES OF SOVIET EXPORTS TO THE CAPITALIST COUNTRIES, 1973 AND 1974 [1]

	1973		1974	
	Exports of 8 products to developed capitalist countries (1)	Total exports to all capitalist countries (2)	Exports of 8 products to developed capitalist countries (3)	Total exports to all capitalist countries (4)
Growth rates of:				
Real Exports (percent)	14	24	(13)	23
Export Prices (percent)	57	21	103	17

[1] See text for definitions of categories of products and country groupings.
Sources: "Vneshniaia Torgovlia SSSR: statisticheskii sbornik" (1973, 1974), and Hewett (1979).

This was a period of generally soaring raw material and fuel prices on world markets, as reflected in the average price increases for the foregoing eight-product group of 57 and 103 percent in 1973 and 1974 respectively. While the aggregate quantity and price developments for 1973 (column (2)) seem roughly consistent with those for this narrower export category (column (1)), the results for 1974 (column (4) vs. column (3)) lack plausibility. The sharp reported decline in real exports for most major primary products to the West in 1974 (see column (3)) is confirmed by Western trade statistics for this period, as is the explosive increase in prices for these products.[3] But these results, combined with column (4), imply that real exports of other products to the West together with total exports to the LDCs increased at a rate far in excess of 23 percent in 1974. At the same time, the average price of these remaining exports to the capitalist world would have had to *decline,* in order to obtain the results reported in column (4). Given the underlying inflationary conditions on world markets at that time, and the world commodity price boom and quadrupling of petroleum prices in particular, such an implied price development is unlikely, although not impossible.

In the next section we analyze this apparent inconsistency in more detail. In the final section we explore several alternative explanations for this finding.

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[2] These products were the subject of a study by Hewett (1979), from which the data in columns (1) and (3) in Table 1 are taken. Hewett's calculations were based on official Soviet foreign trade statistics.

[3] Wolf (1980).

II. THE PUZZLE IN DETAIL

Two basic identities are used in the following analysis. First, for the growth of total exports, in either value or real terms, we have:

$$(1)\ \hat{X} = \overset{n}{\Sigma} / w_i \hat{X}_i$$

where for the ith group of exports $\hat{X}_i$ is the percentage change in exports and w_i is the proportion of ith exports in the total (i.e., value weight).

Second, for the ith group of exports, or exports as a whole, percentage changes in values, prices and quantities are linked by the following equation:

$$(2)\ \hat{V}_i = \hat{P}_{i+\hat{q}i} + \hat{P}_i \hat{Q}_i$$

where $\hat{V}_i$, $\hat{P}_i$ and $\hat{Q}_i$ represent the percentage change in export value, price and quantity for the ith export group.

Table 2 enumerates the various growth rates and export weights for 1974 which were used in our analysis. These were calculated directly from official Soviet foreign trade statistics and several Western studies of Soviet foreign trade.[4] For purposes of trying to further isolate the sources of the implausible price changes reported in Table 1, we also examined the development of Soviet platinum group and diamond exports, which accounted for about 13 percent of Soviet exports to the West in 1973-74.

TABLE 2.—*Calculated growth rates for Soviet export values and quantities, and calculated export weights, 1974*

1. Calculated from *Vneshniaia Torgovlia SSSR* (1974):

$\hat{Q}$ (all capitalist countries) = 23 percent
$\hat{V}$(DCC's) = 67 percent
$\hat{V}$ (LDC's) = 15 percent
w (DCC's) = .60
w (LDC's) = .40

2. Calculated from Hewett (1979):

$\hat{Q}$ (8 exports to DCC's) = −13 percent
$\hat{V}$ (8 exports to DCC's) = 77 percent
w (8 exports to DCC's) = .60

3. Calculated from CIA (January 1976) and Ericson and Miller (1979):

$\hat{Q}$ (platinum & diamond exports to DCC's) = −11 percent
$\hat{V}$ (platinum & diamond exports to DCC's) = 16 percent
w (platinum & diamond exports to DCC's) = .13

4. Calculated for "residual" exports to DCCs:

$\hat{V}$ ("residual" exports to DCC's) = 70 percent
w ("residual" exports to DCC's) = .27

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[4] Western studies used in these calculations were Hewett (1979) for section 2 of Table 2, and CIA (January 1976) and Ericson and Miller (1979) for section 3. The official dollar/ruble exchange-rate (per Ericson and Miller) was used for conversion of dollar export estimates for platinum and diamonds into rubles.

We are left with four unknowns: (a) 1974 percentage changes in quantities and prices for a "residual" group of Soviet exports to the West, accounting for about 27 percent of total Soviet exports to the West in 1973-74; and (b) 1974 percentage changes in quantities and prices for Soviet exports to the LDCs, accounting for 40 percent of total Soviet exports to the capitalist world in 1974. As indicated in Table 3, we have only three equations linking these four variables. By assuming a value for any one variable, say the percentage price change for "residual" exports to the West (see equation (a) in Table 3), we can solve for the other three unknowns using (a)-(c). A matrix of values for these three variables, given different assumed values for the "residual" percentage price change ($_{PR}$), is shown in Table 4.

TABLE 3.—*Equations relating columns (1)-(4) in table 4*

(a) $\hat{Q}_R = (.70 - \hat{P}_R)\,(1 + \hat{P}_R) - 1$

(b) $\hat{Q}_{LDC} = [.23 - .6(.27\hat{Q}_R - .09)]/.4$

(c) $\hat{P}_{LDC} = (.15 - \hat{Q}_{LDC})\,(1 + \hat{Q}_{LDC}) - 1$

Note: Subscripts "R" and "LDC" refer to "residual" exports to the West and to exports to the LDCs, respectively.

TABLE 4.—ILLUSTRATIVE VALUES FOR THE GROWTH RATE OF SOVIET REAL EXPORTS AND PRICES IN RESIDUAL EXPORTS TO DCC'S AND EXPORTS TO LDC'S

[In percent]

Row	P ("residual") (given)	Q ("residual")	Q (LDC's)	P (LDC's)
1	−50	240	−27.5	59
2	−29	139	15	0
3	−20	112.5	25	−8
4	0	70	42.5	−19
5	70	0	70	−32
6	100	−15	77.5	−35

From Table 4 it is clear that while average prices for both groups of exports ("residual" exports to the West and exports to LDCs) could have fallen in 1974 (see row 3), prices could not have risen for both groups. If "residual" export prices had remained constant (see row 4), average export prices to the LDCs would have had to fall by 19 percent. If the latter prices had remained constant (row 2), average "residual" prices would have had to decline by 29 percent. Unit values for a number of Soviet exports to the West fell in the recession year of 1975, but it is difficult to imagine many prices actually falling in 1974. The next section evaluates some plausible alternative explanations of these results.

III. ALTERNATIVE EXPLANATIONS OF THE PUZZLE

The foregoing percentage changes in export "prices" are in effect derived by subtracting 1.00 from the ratio of an index for export values divided by an index for export quantities. From a technical standpoint, therefore, a negative movement in prices for a given group in 1974 can be caused by some combination of three factors:

(1) an actual decline in average export prices for that group, (2) an understatement of 1974 export values for the group, or (3) an overstatement of 1974 quantities for that export category.

Given the general trend of rising world market prices, it is difficult to conceive of price declines in Soviet "residual" or LDC trade large enough to cause the results suggested in Table 4. One possible exception, however, might be Soviet arms deliveries to the LDCs. In the 1970s these have been estimated to have accounted for between 40 and 55 percent of total Soviet exports to the developing countries.[5] It is possible that in the wake of the 1973 Middle Eastern war the Soviets pushed arms on various countries at such a rapid rate that they were forced to cut prices.

To understand the implications of this possibility for Soviet real shipments of arms to LDCs, assume for illustrative purposes that the average price for "residual" exports to the DCCs remained constant between 1973 and 1974 (i.e., row 4 of Table 4). This implies a price decline of 19 percent for exports to LDCs, and an expansion of Soviet real exports to that region of 42.5 percent. If these price reductions were confined to arms deliveries, then they would have had to average some 35–40 percent, because arms sales account for roughly one-half of total Soviet exports to LDCs.

Ericson and Miller (1979) estimated that the value of Soviet military deliveries to LDCs fell by 26 percent between 1973 and 1974, to about $2.3 billion. Vanous (1981) suggested a decline in 1974 of between 4 and 6 percent, to between $2.0 and $2.2 billion. If either of these two estimates were correct, and average prices on Soviet arms shipments fell by, say 35 percent in 1974, then Soviet arms exports would have had to increase in real terms by 14 percent (Ericson and Miller) or 46 percent (Vanous).

Another possibility is that export values were unintentionally underestimated and/or quantities were overstated in 1974. Soviet foreign trade statistics for that year have not since been significantly revised, however, which suggests that misstatement, if it occurred, would have been intentional.

We can think of two possible motivations for misreporting. First, after showing an 18 percent improvement in their terms of trade with the capitalist countries in 1973, the Soviets might have desired to avoid showing a further increase in 1974.[6] This could have been accomplished by either overstating the quantity index which they report for trade with all capitalist countries, or by simply understating the total value of trade with the capitalist countries.

A second, and possibly more compelling motivation, might have been to conceal the real magnitude of Soviet arms exports to the LDCs in 1974 by understating the aggregate value of exports to the LDCs. This would not be difficult, since typically about half of all such exports (in value terms) are not detailed by commodity group or country destination anyway. Indeed, it is the discrepancy between the reported total value of exports to LDCs and the sum of individual LDC totals which is often taken as an approximation of Soviet arms deliveries to the LDCs.[7]

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[5] Vanous (1981).

[6] Hewett (1980) has calculated, using official Soviet statistics, an 18 percent increase in Soviet terms of trade with the capitalist countries in 1973, followed by declines of 2.5 percent in 1974 and 19 percent in 1975

If this explanation were correct, it would suggest an increase in arms deliveries to LDCs in 1974 in value terms, a development that runs counter to the aforementioned changes for 1974 estimated by Western experts.

For illustrative purposes, again consider row 4 of Table 4, where constant prices for "residual" exports to the West in 1974 are assumed. (Actually, we would argue that the real results would have fallen between rows 4 and 5 in the Table. Consequently, we are probably understating the growth of real arms exports to the LDCs, if this general explanation is correct.) Further assume that in reality average prices on exports to the LDCs were constant. This would imply a 42.5 percent increase in the value of exports to LDCs in 1974, against a reported 15 percent. The difference would be accounted for entirely by an understatement of the value of military shipments to the LDCs. This would translate into an actual level of Soviet arms deliveries in 1974 of about $3.2 billion, roughly 50 percent higher than the aforementioned estimates. This figure would also be about $600 million above the estimate for Soviet arms deliveries to LDCs contained in CIA (November 1978), which is based on estimated actual Soviet export prices for military equipment.[8]

Of course, an understatement of Soviet arms sales to LDCs for 1974 does not necessarily mean that Western analysts consistently understate Soviet arms deliveries. Unfortunately, however, we cannot repeat this analysis for other recent years because it is precisely the dramatic price increases and cutbacks in real exports of some key primary product exports to the West in 1974 which highlight the "puzzle" in the 1973–74 (official) Soviet foreign trade statistics.

Given the present state of information regarding Soviet foreign trade, particularly with the developing countries, it is impossible to knowledgeably choose among the above mentioned competing explanations of this conundrum in (official) Soviet foreign trade statistics. If there is some simple explanation we have missed, hopefully this note will bring it to the surface. But in the absence of such an explanation this analysis does create new doubts regarding the internal consistency and reliability of these statistics, and it also raises new questions about how Western analysts attempt to estimate the magnitude of Soviet arms deliveries to the Third World.

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[7] See CIA (May 1978) and Vanous (1981).

[8] Another possibility is that the quantity index reported in Vneshniaia Torgovlia SSR refers only to exports of civilian goods to the capitalist countries. But when calculations similar to those in tables 2-3 were made, in effect excluding conventionally estimated arms exports by eliminating the "unspecified" component of exports to LDCs, the results were similar to those reported in table 4. In other words, average prices would have had to have declined for "residual" exports to the West and/or for non-arms sales to the LDC's.

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